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Original Contributions.

SUCCESSFUL CASE OF REPLANTATION.

By A. N. Ferris, D.D.S., Waterloo, Iowa.

In June, 1895, I extracted a right superior molar, because on account of the tortuous, crooked roots and miniature canals I was unable to treat the abscessed condition. In the operation the anterior buccal root was broken off at its union with the crown, and I extracted it. I then disinfected and filled the canals of the unbroken roots, filled the cavity of the tooth with alloy, smoothed the surface where the root had broken off, and replanted the tooth. After a few days of slight soreness it became as useful as ever and is in good condition at the present time.

DENTISTRY SUFFICIENT UNTO ITSELF.

By W. E. Driscoll, D.D.S., Manatee, Fla.

Of all that I have read eulogistic of the career and character of Dr. Thomas W. Evans, nothing has so impressed me as these lines from the resolutions of the American Dental Club of Paris: "He was first, last and always a dentist, and proud to be considered one, and despised that 'snobism' which makes some men ashamed of the profession to which they owe all their success in life."

This, emanating as it does from those best able to know the facts, constitutes to my mind the crowning feature of his personality, which should exalt his name forever among dentists. How often we have to blush for the sycophantic display by prominent dentists toward the medical profession. So persistently is this manifested in many cases that one marvels why they do not take themselves where they think all the honor resides.

Lawyers and ministers must be trained in all the fundamentals of oratory for a length of time and to a degree of perfection that have no parallel in the groundwork of medicine and dentistry. So

with their professional duties, there is a similarity in the preparation of sermons and pleadings, both calling for mental labor, which finds nothing so near alike in medicine and dentistry. A man or set of men belonging to either of the former professions who would appeal to the other for "recognition" would be considered good candidates for a lunatic asylum.

The regular duties of the lawyer and minister keep fresh in mind those basic acquirements which are common to both professions. In the practice of dentistry, however, one has so little to remind him of his anatomical studies that by the time a graduate becomes expert in the real requirements of his profession by practice, he has so far forgotten his anatomy that he would fail to pass an examination should he desire to relocate in another state.

There is not one thing in the line of regular practice which a dentist and physician can do with equal propriety. The only honorable and professional course is for every dental and medical practitioner to send cases coming to him for treatment to the domain in which they belong. If they were not independent and separate professions there would not be this complete and all-pervading difference. Let each one store his mind with every fact of importance in any science that will make him a broader man and a better dentist; but that is far different from wearing badges or accepting degrees which may or may not be of real honest worth.

An educated preacher can attend a four or five months' course of law lectures, and probably be admitted to the practice of law in any state of the union, but does any one suppose that a physician can be transformed into anything worthy the name of dentist, as one must now practice, in any such short time?

All who have been readers of our periodicals during the past twenty years will remember what determined efforts were made up to about ten years ago to divide the dental profession. One body was to assume all the character, honor and prestige, while those left were to be stigmatized as common, unprofessional mechanics, to be employed, when the high-caste men cared to notice them at all, to do the menial part, the purely mechanical work, but they were not even to be allowed to extract teeth, although every state permits almost anyone to do this with absolute freedom.

That movement failed so utterly that it is probable it will never be attempted again. Still, as intimated by the eulogists of Dr. Evans

in the resolutions quoted, there are still men in our profession who show in many ways that they are ashamed to be called dentists. Some have adopted the name "Oral Surgeons," others "M.D's, practicing the specialty of dentistry," others "Stomatologists," and in fact had made more shifts to save their pride than I can recall, but without avail, for the public settles the matter and calls them dentists.

Let us, like Dr. Evans, magnify our calling so far as we can. Let each one honor dentistry as he did, and there will be no need of aping another profession. He proved there was ample room for any man's ambition within the ranks of the dental profession.

TREATMENT OF FRACTURED MAXILLARIES.

By D. S. Arnold, D.D.S., Atlanta, Ga. Read before the Tri-State Medical Society, at Nashvile, Oct. 12-14, 1897.

I hope I may not be considered presumptuous in atempting to discuss a subject so important as the treatment of fractured jaws. The motive which prompted me to select this as my subject was not a wide experience in treating fractured jaws, or anything very new or original I had to offer concerning the management of such cases, but since beginning the practice of dentistry it is a subject that I have taken a deep interest in, and one that is of great worth to every practitioner of our beloved profession.

The force which produces a fracture of the upper jaw must as a rule be direct and of great violence. A kick from a horse, a blow from some machine, the impact of a pistol ball, are among the most common causes of this injury. The fracture is often comminuted, and is sometimes followed by concussion of the brain, or with fracture of other bones of the face, or at the base of the skull. Associated as the upper jaw is with no less than 19 bones, such results create no surprise. This extensive connection of the superior maxilla will explain the modus of the singular accident presented by Packard, where a man's head was caught between a hoisting machine and the floor, causing the entire separation of the face from the cranium. Fractures of the upper jaw are often caused by force transmitted from the malar bone, this bone remaining sound. This portion of the face being prominent is likely to receive the vulnerating body first. But the bones most likely to participate in fractures of the superior maxilla are the malar, the nasal, the palatine, and the pterygoid process of the sphenoid.

A cardinal principle to be observed in the treatment of all fractures of the superior maxilla is to preserve and replace all fragments and splinters, the tendency to heal in this bone being greater than in any other bone of the skeleton. That the best results may be obtained it is necessary for the dentist to have a perfect knowledge of the normal relations of the jaws and teeth, and a thorough familiarity with all appliances calculated to produce the best results, and at the same time give the most comfort to the patient. The general surgeon is invariably called upon to attend these cases, but now the more enlightened ones request that a dentist be also called, for they at once recognize their absolute inability to overcome the mechanical difficulties that may be presented in the case at hand. It is to our profession that all honor is due for the wonderful progress made in the treatment of fractured jaws, for the most approved methods and best appliances have emanated from dentists, and this as a specialty in surgery belongs entirely to the dental surgeon.

The fractures of the lower jaw are divided into the body, ramus, and processes and are generally caused by direct force either upon the side of the bone or upon the chin. When involving the body they may be situated at any point from the angle to the symphysis of the bone; they may extend through the entire thickness of the bone, or be confined to the alveolar process. Generally there is not much difficulty in determining a fracture of the lower jaw, although when the separation is incomplete it may not be so easy. There is a fixed and deep pain, which is generally increased by any movement which disturbs the quietude of the jaw, as opening and closing the mouth, swallowing, or even taking a deep inspiration. We might suppose from its position that the inferior dental nerve would frequently suffer damages in fractures on this bone and consequently give rise to serious trouble, and yet such injury is almost unheard of. Swelling of one or more of the salivary glands is occasionally met with, and may end with an abscess opening into the mouth or upon the neck, but fractures of the inferior maxilla usually do well when the proper treatment is given. Tardy union is not uncommon, but non-union is very rare. It is believed that saliva has some influence in retarding the union of the bone, and the presence of the smallest particle of necrosed bone will defeat the healing process.

The diagnosis of a fractured jaw is unmistakable, the most prominent symptoms being pain, swelling and crepitation, and hemor-

rhages when displacement of the teeth has occurred. When any doubt exists as to location of the fracture in the lower jaw, grasp the bone on each side and then introduce the index fingers into the mouth, the fingers resting upon the teeth, and with slight in and out movement you will locate the crepitation at the point of fracture. In the upper jaw use the thumbs instead of the index fingers.

Fractures are simple when only the bone is divided without piercing the integuments; compound when laceration is present and direct communication between the outside air and the fracture; and comminuted when the bone is broken or crushed into several pieces at the same point and communicating with each other. Fractures of the inferior maxilla, if the body of the bone is involved, are almost always compound in the direction of the mouth, but when the ramus, coronoid process, or condyle are fractured, the bone is too deeply seated for the injury to extend into the mouth unless caused by a gun shot or missile.

Teeth that are loosened or fractured should not be taken out, for they nearly always become firm and useful afterwards. But should a nerve become exposed in the tooth by accident it is best to destroy it, so as not to cause the patient any unnecessary pain. Before taking the impression for an interdental splint always carefully remove any tartar that may be around the teeth, or else you will have as a consequence a loose-fitting splint. You now take impressions of both jaws, always taking the impression of the uninjured jaw first, so as to reassure the patient that it will not be painful, and for impression material I always use modeling composition, as plaster paris is objectionable to the patient and will invariably get into the lacerations if any be present. I favor Dr. Gunning's method of taking an impression—that is to hold the jaws as near the normal position as possible, sawing your model afterwards at the point of fracture, and articulate it with the upper teeth, recementing it with plaster. But should any mistake occur in the articulation the failure of your splint is assured, so you necessarily have to be very careful in the articulation of your divided model with the upper jaw.

Fractures of the superior maxilla require but little treatment compared with those of the lower, because the bones are immovable and you have no trouble keeping the fractured parts together. I always make my splints for the lower jaw so as to prevent the use of the jaw

in any way whatsoever by the patient, for in all cases that I have seen where the jaw was used to masticate I have invariably seen so excessive an amount of bone follow as to deform the patient for life—an osseous tumor at the point of union that only an operation will remove, and this is caused by the continued irritation that follows the constant slight rubbing together of the points of the fractured bone in masticating.

I will now briefly report two cases recently treated with wonderful success. The first case is that of a barkeeper, forty-five years old, who had been shot with a 44 Colt's revolver at close range, the ball entering left side of lower jaw between third molar and first bicuspid, plowing out the intervening teeth and bone. The ball was buried under the tongue, having greatly lacerated the soft tissue of the mouth. After removing all the small particles of bone and the bullet from the lacerated parts, I held the jaw as nearly as possible in its normal position and took the impression with modeling compound. I of course took the upper jaw first, and after getting my models ready I took my saw and cut the model of the lower jaw midway the point of fracture, and carefully articulated the fractured model with the upper teeth, which I had no trouble in doing. I then reunited my broken model with plaster. The splint covered all the lower teeth on both sides and was made so as to touch the upper teeth on both sides and in front. Putting this in the mouth I carefully secured the jaw with a four-tail bandage. In three weeks I removed the splint and found a beautiful reformation of the lost bone, having no excessive bone whatsover, and but for the small scar on the outside, to-day you could not tell he had ever been shot. I replaced the lost teeth with bridge-work.

The other was a machinist, twenty-four years old. He was standing by a machine when a piece of heavy timber was caught in one of the wheels, and swinging around it suddenly struck him with the sharp edge on the chin, knocking the six anterior teeth imbedded in the alveolar process back in his mouth, making a complete separation. I simply took the piece and by a little work succeeded in getting it back in place, and then beginning with the bicuspid at the right side I wired all the intervening teeth around to the corresponding tooth on the left side, and an uninterrupted union followed; the patient using his jaw all the time for mastication, and strange to say, all the displaced teeth presented every indication of possess-

ing nervous sensation. I am firm in the belief that the nerve reunited and is now in a healthy condition.

You should always be careful and keep the mouth thoroughly cleansed with antiseptic preparations, and after a few instructions your patient will become quite expert at doing this for himself. I use a strong solution of carbolic acid in a metal abcess syringe for this purpose.

ARE DENTAL STUDENTS PROPERLY EDUCATED?

By W. H. Duddy, D.D.S., Boston, Mass.

Why is it that so many graduates of dental colleges know so little about practical dentistry at the completion of their college course? Many of them admit that they really know almost nothing concerning the actual operations they are called upon to perform in daily practice, but even if they do not acknowledge their inability, all dentists of experience can readily see it. If only one or two in a large class, instead of a great number, were unable to perform necessary dental operations, we would be justified in the conclusion that the fault lay more with the students, and that they had entered a profession for which they were entirely unfitted.

The number of unqualified ones is so large, however, that we are forced to ask if the system of teaching dentistry is all that could be desired. Is it right or just to take the valuable time of these students, to say nothing of taking their money, only to have them discover that the object sought for has eluded them? Does it show that the men at the head of our institutions have grasped the true idea of education? Are they not deluded simply by custom? Is not the idea that dentists should be educated in several allied branches, as well as in the dental, erroneous? Have they not been deceiving themselves with the false notion, that in order to know how to perform operations in one profession it is necessary to study the requirements of another a greater part of the time?

Education in its true sense should always be encouraged, yet the vast majority of students who enter dental colleges do so because they are mechanically inclined, and not because they are students of books. If they desired to become physicians they would enter medical and not dental colleges. Yet in defiance of the natural tendency of their minds, they are turned completely about and forced to pore over studies they dislike and consequently never learn. After

the examinations are finished the only thing they remember with clearness is that they studied certain subjects. It then suddenly dawns upon them that they have received a very thin veneer of several different studies, which is worn off by the first contact with the world. I know it is the custom to say that these students are being educated, but any teacher knows that crowding a mass of matter into a person's head is anything but education.

Far better would it be for all concerned if one-half the ground were covered thoroughly than the whole of it in such an unsatisfactory manner. It is impossible to take individuals who are not inclined to study, and by compelling them to listen to lectures and to pore over books for three years make educated beings of them. If it is necessary for men to be educated in order to become dentists, their education should begin before entering the college and not afterward. Anyone who examines applicants for admission knows that very few of them have sufficient education to even begin the study of the numerous branches laid down in the college curriculum.

Dentists by acknowledging the necessity of stating the medical branches to such an extent, admit their own inferiority. They might with equal justice declare that it does not require three years to learn dentistry, so the students are obliged to study medical subjects in order to utilize the time. The sum and substance of education is the development of the mind, and after our school days are over the mind should be developed first along the line which it is to follow through life.

I therefore contend that it is vastly more important for dentists to know more about mechanics than medicine. When I say mechanics I refer to every single detail associated with the successful manipulation of all dental materials. Too often are dentists afraid to use the term, and they skirmish about for some word to apply in its place, when they know full well that their vocabulary will not furnish one. They are well aware that the greater part of dental operations are purely mechanical, however much they may object to acknowledge it. If a high degree of skill be attained, however, instead of being ashamed to use the word, they would rather glory in it, for I doubt not the mechanical skill required of a dentist is seldom exacted in other vocations. It is necessary for him to possess steady nerves, a cool head, a high degree of manipulative skill, and a mind hypnotic in its influence, because the obstacles to

be overcome by his knowledge of mechanics are greater than in almost any other calling.

Furthermore, it is of vital importance that special faculties be trained without which dentists cannot succeed. Observation is one of the chief powers required by dentists. As a rule the graduates are not weak in their understanding or judgment regarding dental operations. For instance, they can easily understand why a cavity should be prepared, as they are taught this; in fact it is so easily grasped that it tends to weaken the observing faculty. The principal difference between many dentists can be traced to the power of this one thing. A great many men are heavily handicapped throughout their whole lives simply because they have not been endowed by nature with a power of close discernment. For the benefit of such men it is necessary that some means be devised for their proper training. All institutions of learning seek to strengthen the weaker faculties of the students, and our dental colleges should strive to accomplish the same.

I mention the faculty of observation simply as an illustration, and not by any means as the only one in need of training. If students were obliged to devote more time to the cultivation of certain faculties by methods which might be devised, instead of spending so much time on studies which they glided over only to discard when released from mental slavery, it would be far more beneficial to them and much better for the public. The so-called system of education which is thrust upon them does not develop their minds; in fact, it stunts their growth. Whereas, if a more natural system were in vogue, the mental development would be more salutary, and those so inclined would be better able to apply themselves to any particular study, with far better chance of successfully mastering it. It requires three full years to gain a fair knowledge of the art and science of dentistry; all superficial and surplus instruction should therefore be abolished.

TONSIL TUMOR —A recently developed unilateral non-inflammatory new formation in a subject past middle life is suggestive of malignancy, especially if the growth is hard, dense and of rapid progress.—*Newman.*

DECOLORIZED ALUMINUM.—The *American Druggist* states that gray or unsightly aluminum may be restored to its white color by washing with a mixture of 30 gm. of borax dissolved in 100 gm. of water, with a few drops of ammonia added.

Digests.

SUPERNUMERARY TOOTH IN THE PALATINE VAULT. By R. Cadwallader, M.D., Fall River Mills, Cal. A young man (Indian) came to me to have a tooth pulled. I ran over his mouth without finding a faulty tooth in his head; every one was perfect and sound. He called my attention then to its location. I found a tooth exactly in the median line of the palate on a transverse line between the two first molars. There was no photographer within forty miles, or I should have had the vault reproduced with the tooth *in situ*. I extracted it with some difficulty. It measured one-half inch in length, with a hooked root which penetrated the vault.

The recent work on "Anomalies and Curiosities of Medicine" contains a short note concerning supernumerary teeth in this situation, and states that Fanton-Touvet gives an example of a supernumerary tooth implanted in the palatine arch. It would be useless to theorize as to how it came there. It could be developed only from a dental center displaced, or else be a deciduous tooth forcibly implanted by some accident. Against this latter are its anomalous shape and the statement of the young man that it had been there ever since he could remember.—*Medical Record, Feb. 1898.*

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UNUSUAL CASE OF BLOOD CYST OF THE POSTERIOR NARES. By John N. Mackenzie, M.D., New York. The patient was a young lady of 23. As a result of the imperfect extraction of a tooth, there was necrosis of the jaw, with subsequent exfoliation of bone, leading to a more or less complete obliteration of the lower portion of the antrum. This happened five years before consultation. For three years before consultation she had suffered with symptoms referable to the orbit and antrum. On examination a small glistening point was seen, resembling the appearance seen in fibroma of the nasal cavity. The right side of the nose was occluded. The mass looked very much like a child's toy balloon. The envelope of the cyst was extremely attenuated looking as if it was scarcely a line in depth. I made an appointment with her to return the same day, but in the meantime a spontaneous rupture occurred, and when I examined her the next day I was unable to find any trace of the

growth. The inflammatory process which originated the trouble probably started in the antrum as a result of the necrosis of bone, and from this the edema and subsequent formation of the cyst had resulted. I consider this a unique case. Some cases of large serous cysts have been reported.—*Jour. Am. Med. Assn., Feb. 1898.*

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ACUTE INFLAMMATION IN THE MAXILLARY SINUS. By Wadsworth Warren, M.D., Detroit, Mich. Acute involvement of the antrum of Highmore, less than empyema, deserves more consideration in connection with hypertrophic conditions in the nose, because of the annoyance to which it gives rise, and on account of its causing, through frequently recurring attacks, a chronic inflammation and thickening of the sinus, and the possible origin of an empyema. In Hajek's ambulatorium in Vienna the comparative frequency of empyema of the various accessory sinuses is approximately as follows: For 200 cases of empyema of the maxillary sinus there are about twenty ethmoid empyemas, eight frontal sinus empyemas, and four of the sphenoidal sinus. It may be seen from this that the vast majority of all affections of the accessory cavities of the nose involve the maxillary rather than the frontal, ethmoid or sphenoid cavities. From this it is reasonable to infer that the acute involvements of mucous surfaces, less than empyema, and which subside often spontaneously and under appropriate treatment do not recur, involve the maxillary sinus much more commonly than other cavities.

In a long series of post-mortem examinations by Zuckerkandl in cases in which chronic nasal catarrh existed without any history of accessory cavity empyema, that author found in a large number of cases very decided pathologic changes in the mucous lining of the antrum, and very rarely slight changes in the other cavities.

There is an anatomical reason why inflammation in the maxillary sinus is much more common than in the frontal sinus or anterior ethmoid cells. The opening from the middle meatus into the antrum lies at the bottom of the hiatus semilunaris and is directed downward and forward, while the opening into the frontal sinus and ethmoid cells is at the upper part of the hiatus and directed upward and forward. Again, in the case of the antrum, the opening into the nose lies in the upper part, close up beneath the floor of the orbit, not facilitating free drainage, while the opening from the other sinuses

lies near the bottom of those cavities and permits good drainage except when the passage is obstructed.

Fig. 1, prepared from an anatomical specimen in the writer's collection, is a longitudinal section through the left naris close to the septum, and shows the outer wall of the left nasal cavity. The middle turbinate which overhung the hiatus semilunaris has been entirely removed. A bristle is passed into the antrum through the ostrum maxillaræ, which opening occupies the normal position at the lower end of the hiatus. At the upper end of the hiatus is a small opening not shown in the cut, leading to the anterior ethmoidal cells and the frontal sinus. In preparing the specimen the saw has opened the frontal and sphenoidal cavities. The mouth of the Eustachian tube is shown just behind and on a level with the posterior extremity of the inferior turbinate. The bristle entering the antrum is directed downward and slightly forward and enters the top of the cavity just beneath the floor of the orbit.

Another figure is a transverse section of the right side, showing the septum, the right nasal cavity, and the antrum. The specimen that furnished the illustration was from a case in which existed an acute rhinitis with involvement of the antrum. Within the antrum are seen large tumefactions resembling cysts, which in reality are only swellings of the mucous membrane caused by the acute inflammation and infiltration. The secretion in such a case is muco-serous and not purulent.

The following cases may serve to illustrate the symptoms produced by and the means of relieving this condition. *Case 1.*—Male, aged thirty-one. Septum strongly deflected to the right side with a long bony ridge on the convexity. Right middle turbinate hypertrophied and in apposition with the ridge. Patent subject to repeated attacks of acute rhinitis. While diving in about ten feet of water he struck the soft bottom, and both nostrils were partially filled with mud. Within a few hours another severe attack of rhinitis occurred, which in addition to the ordinary symptoms was accompanied by pain on the right side of the face, slight bogginess and edema of the right lower eyelid, and tenderness to pressure in several of the right upper teeth. Patient complained that these teeth felt longer than the others. Three days after the beginning of the attack and at the time the intranasal swelling usually decreased, there was a profuse, clear, yellow serous discharge from the right

naris. The discharge occurred when the head was bent forward or to the left, and ceased when the head was held erect. After about ten days of palliative treatment it ceased entirely. The spur was then removed with the saw, and the anterior portion of the middle turbinate lightly cauterized. In the year that has elapsed since the operation there has been no recurrence of the unilateral discharge.

Case 2.—Female, aged eighteen. Chronic hypertrophic rhinitis. Patient complained of an unnatural discharge from the right nostril. There were slight hypertrophies along both turbinates on the right side. In the right naris the lower turbinate was hypertrophied throughout its extent. The anterior portion of the middle turbinate was hypertrophied. After cleaning out both nares, applying a four-per-cent cocain solution to the middle turbinate, and waiting a few moments, having the patient's head bent forward, an unnatural, flaky, odorless, muco-purulent discharge appeared under the edge of the middle turbinate. The course of the irritating discharge could be traced posteriorly on the right side of the pharynx, where it had set up secondary inflammation and thickening. In this case I removed the anterior tumefied portion of the middle turbinate with the cold snare and etched the wounded surface with trichloracetic acid. After this treatment it was possible to see with good light the lower part of the hiatus similunaris. With the use for a few weeks of a mild antiseptic spray the discharge from the sinus ceased entirely, and the secondary trouble in the pharynx disappeared. Nine months afterward there had been no recurrence of this discharge from the sinus.

Case 3.—Female, thirty-five years of age; gave a history of an injury four years ago to the anterior wall of the right maxillary sinus. It had been four or five months in healing, and the site of the injury was marked by a depression and cicatrix. I could get no history of dead bone and there was no fistula. Examination of the nose showed an immense fibrous hypertrophy of anterior extremity of the right middle turbinate, beneath which several small mucous polypi protruded. After removing with the snare the anterior extremity of the middle turbinate and the larger polypi, the mucous surface about the hiatus was cauterized extensively. Following the operative measures patient used an alkaline spray for a few weeks.

In this case also there was a definite history of an unnatural discharge from the right nostril, influenced by position of the head, and

evidently as a result of this muco-purulent discharge a secondary inflammation of the pharynx confined chiefly to the right side. Six months before I saw this patient she had an acute right otitis media with rupture of the drum and considerable subsequent discharge, from which under appropriate treatment she had recovered at the time she came under my care, though there remained slight thickening of the drum and partial occlusion of the Eustachian tube. After correcting the local condition in the nose, daily dilatation of the Eustachian tube with the compressed air apparatus for a few weeks completely restored the function of the right ear. During the six months subsequent to this treatment there has been no recurrence of the discharge from the sinus, nor of the polypi. The patient, further, has practically perfect audition in the right ear and no pain or discomfort. In this last case the middle-ear catarrh was undoubtedly secondary to and directly caused by the entrance into the tubal orifice of some of the muco-purulent discharge from the inflamed maxillary sinus. When recumbent in bed the secretion would naturally flow over the mouth of the tube.

I submit in conclusion the following propositions: (1) That the condition described, an acute involvement of the maxillary sinus, less than empyema, is a definite pathologic condition, of not very rare occurrence. (2) That it may be recognized by the unnatural unilateral discharge influenced by the position of the patient's head, by the local symptoms, and the secondary inflammation and thickening caused by the discharge. (3) That it is accompanied by (probably as a casual factor) some partial obstruction to the ostium maxillaræ, and is relieved when this obstruction is permanently removed.—*Medical Age, Feb. 1898.*

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CASE OF HYPERTROPHY OF THE GUMS. By Mr. Whittaker. Read before Manchester Odontological Society. About eighteen months ago patient noticed swelling and soreness of gums on right side and in upper jaw; about the same time, or a little later on, the gums of the lower jaw began to swell, and swelling began to extend all round the gums. Fourteen months ago patient was advised to go to Blackburn Infirmary by Dr. Fraser, who had previously seen her and given her mouth-washes and medicine. At the infirmary patient remained about seven months, and had her gums removed twelve times during that period—seven times without an

anesthetic, and five times under chloroform. She had her gums cut, cauterized and removed in various ways, but they grew again and became as large as ever in a few days. Patient has suffered much from toothache during the last eighteen months, especially from a tooth on the right side, the 2nd right upper molar. This tooth troubled her just before her gums began to swell, and patient tried to have it extracted, but all the dentists she went to refused to draw it. At the first operation at Blackburn Infirmary they tried to extract this tooth during the operation under chloroform, but failed and broke the tooth, part of it remaining in the jaw and this piece is still in. Patient said that her teeth felt loose when gums first started to swell, and that they feel loose now early in the morning, when her face is also swollen; patient has a bad taste in her mouth, and matter oozes up from the roots of the teeth, which are covered with tartar in the morning.

An operation was done on the 13th. Ether. Enlarged gums in the upper jaw were chiseled away and the gums were then cauterized. Other portions were removed with curved scissors. The last molar tooth on the left side was extracted. The lower jaw was not touched. On April 30th chloroform was given and the gum on the lower jaw was freely removed from the external surface with scalpel and dissecting forceps. The raw surface was well cauterized with the thermo-cautery.—*Brit. Jour. Sc., Feb. 1898.*

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PHILOSOPHY OF EXUDATIVE INFLAMMATION. By John Rogers, M.D., New York. Read before New York Institute of Stomatology, Nov. 2, 1897. The reaction which follows a traumatism or the introduction into the tissues of microorganisms is conveniently called an exudative inflammation. It is a term which expresses the difference between the more violent reaction, which is accompanied by redness, heat, pain and swelling, and the less violent and in general more chronic response produced by other forms of injury. For injury of one character or another is now conceded to be the origin of such changes as cirrhosis of the liver, endarteritis, the degenerations of phosphorus-poisoning, the manifestations of syphilis, new growths like sarcoma, etc.

The exudative form of the process is the most common. It occurs not only after the lodgment in the tissues of microorganisms, but also after every traumatism. It is nature's response to an injury,

and the changes which take place are of a conservative and reparative character. To show this it is necessary to examine each stage or step in such a reaction. In its simplest forms the exudative part of the process is not so prominent as the part which is reparative. If, for example, a simple incised wound is made, aseptically, in the skin of a rabbit, the reaction is manifestly reparative. A true exudative inflammation follows, but the exudate is slight. Plasma, white and red cells, escape from the divided vessels. Fibrin rapidly forms and glues together the severed edges of the wound. The neighboring vessels dilate, and there is some emigration of leucocytes, which absorb the fragments of inert *debris* resulting from the few fixed cells killed by the stroke of the knife. Incidentally it is worthy of note that a cell does not perish unless its nucleus is damaged. This incorporation in the white cells of living or inert particles will be discussed later, but is mentioned to show the correlation of all the different phenomena of an exudative inflammation.

At the same time with this clearing of the field karyokinetic changes are observable in the neighboring fixed cells. Out of one cell two are formed. The nucleus first shows striations, which collect at opposite sides, and around each half thus made protoplasm is heaped up and the cell divides. The result is an epithelioid cell or fibroblast; it is formative, rounded or irregular in shape, and larger than a leucocyte. The fibroblasts gradually elongate and shrink, and processes develop; in short, new connective tissue develops from the preexisting fixed cells and the parts are restored to their original condition. The important part in this reaction is the proliferation of the fixed cells. It is brought about by indirect or direct division, by mitosis or amitosis, as it is technically called. By mitosis is meant division preceded by certain changes within the nucleus which are accompanied by the formation of peculiar lines and figures. By amitosis or direct division is meant the splitting of the cell and its nucleus into two without any preliminary alterations. In direct division the cell is not supposed to be as vigorous as in indirect division.

If we examine the phenomena following a more extensive aseptic wound the exudate is found to occupy a more prominent position. An example is furnished by snipping off a piece of the surface of a frog's tongue. Under the microscope there is seen to be an initial

acceleration followed by a slowing of the blood-current; at the same time the vessels become dilated and congested.

Thoma has demonstrated that the well-known marginal position of the leucocytes which ensues is due to the difference in specific gravity of the red and white cells. Also that the emigration of the leucocytes takes place in the line of junction of the endothelial cells of the capillaries and small veins. Diapedesis of the red cells occurs at the same points, as does also the escape of most of the plasma. The latter forms a coagulum over the surface of the wound and occludes the divided vessels. Then follows the repair of the injury by granulation. The preexisting fixed connective-tissue cells and the endothelial cells of the capillaries proliferate. From the connective-tissue cells are produced epithelioid cells or fibroblasts; these are amœboid, and with difficulty to be distinguished from the leucocytes which have emigrated from the now congested vessels. The fibroblasts are embryonic in character and actively multiply; they collect in small heaps, into which a prolongation of an endothelial cell of an adjoining capillary is sooner or later pushed. This solid prolongation may join with others from its own or another vessel. Eventually it becomes hollow, and blood circulates through it. Meanwhile the wandering cells, which are derived mainly from the leucocytes of the blood, and probably to a less extent from the proliferation of the preexisting, fixed, connective-tissue and endothelial cells, cover the surface of the wound and infiltrate the coagulum formed just after the reception of the injury. The numbers of the wandering cells correspond directly with the amount of irritation and consequent destruction to which the surface of the wound is subjected. The same thing can be said of the exudation of plasma. If an ill-fitting shoe is constantly rubbing an ulcer of the heel, pus is present in abundance. Remove the shoe and stop the injury to the growing cells and the pus vanishes.

The purpose of the wandering cells is to act as scavengers; they incorporate and digest or carry off detritus, and the greater the emigration the more permeable the vessels become and the greater is the escape of plasma. Some of the scavengers disintegrate and are absorbed by others; many are cast off as part of the pus; a smaller quantity pass into the lymphatic system. A large number of the wandering cells serve as food to the growing fibroblasts. They probably do not, however, change into fixed cells, although the latter do

become wandering cells. The amount of plasma, as previously remarked, corresponds with the cellular activity. In an aseptic wound it serves a flushing out and a nutritive purpose. It aids in the removal of effete matter and supplies nourishment to the rapidly growing cells.

My object in thus hastily reviewing the most prominent features in healing by primary union and by granulation is to emphasize the fact that in these processes there occurs an exudative inflammation, which is anatomically the same as that which follows bacterial infection. That, in short, every manifestation of what we call inflammation, every term to which the ending of "itis" is added and many to which it is not, signifies that the body, made up of many elements, defends itself by assigning to each element a definite duty, which each performs according to need. The marshalling of all the forces may only be evident when microorganisms are to be combated. All are constantly in line and ready to repel attack, but only one or two companies of the army may need to be called into action for a minor injury like an aseptic wound or contusion. For thorough understanding of what is meant by inflammation it is necessary to carry in mind a comprehensive view of the whole field.

We pass now to the more violent form of exudative inflammation, that which follows the lodgment and growth within the tissues of microorganisms. In this the white cells are so numerous and the *debris* so abundant that the inflammatory reaction is more commonly designated as suppurative. But it differs anatomically only in degree, not in kind, from the reaction following a simple aseptic traumatism, and its purpose is the same, namely, the repair of the injury.

If a little of a pure culture of the staphylococcus pyogenes aureus is inoculated under the skin of a rabbit a circumscribed abscess develops. In and around the point of inoculation there is a degeneration and death of cells coincident with a multiplication of the bacteria. The surrounding vessels are congested and there is an emigration of leucocytes, some of which are mono- and others polynucleated. There is also an exudation of plasma and some diapedesis of red cells. A little later many of the bacteria can be made out in the interior of the emigrated white cells and in the endothelial cells of the neighboring capillaries. This incorporation of bacteria in living cells will presently be described as the process

of phagocytosis. The multiplication of the bacteria gradually ceases, then the central portion of the disturbance becomes pus, or a mass of broken-down *debris*, bacteria, fatty matter, white cells, etc., and is discharged externally, leaving a cavity to be healed by granulation. An example of a less favorable termination is furnished by the inoculation of a chicken with the vibrio of Metschnikoff. In this instance the bacteria do not remain localized, but spread from the point of infection almost without hindrance into the blood-vessels and lymphatics and the general circulation. There is extensive degeneration of all the cells near which the bacteria appear. This includes the cells which constitute the walls of the vessels, and with the destruction of the walls of the vessels hemorrhage occurs. At the same time in the region of the bacteria there is a copious exudation of a sero-sanguinolent fluid; but there is no emigration of leucocytes and no phagocytosis, which are two significant points of difference between the localized abscess and the general infection. In the former the leucocytes are numerous and close around the bacteria; in the case of general infection there is no massing of leucocytes; the few which appear are evidently degenerated and quickly perish.

To be complete, croupous, necrotic, or diphtheritic inflammation should be mentioned. But it mainly differs from the localized abscess and the diffuse cellulitis with general sepsis in that a mass of cells perish more or less rapidly and together, instead of slowly and one after another. Furthermore, in croupous inflammation the dead mass does not disintegrate and liquefy till after the lapse of some little time. But the philosophy of the minute phenomena is practically the same, and it is to this I want to call your attention.

The first elements to be considered are the wandering cells. Many are derived from the proliferated fixed tissue-cells, but the larger proportion have been proved by Cohnheim to be the emigrated leucocytes of the blood. These differ in their appearance, size, probable ultimate origin, and staining reactions. One of the latest classifications of human leucocytes enumerates six distinct kinds. Of these at least two have been ascertained to have definite functions.

Their presence or absence around an injurious body is dependent upon the latter's attractive or repulsive powers, upon a positive or a negative chemiotaxis, as it is called. This simple fact was not grasped till attention was called to the approach in water of a certain

The amœba—a unicellular organism comparable to the leucocyte —approaches and ingests certain living organisms or diatoms which serve as its food. In the amœba the diatom lies in a cavity containing an acid fluid, and by this is gradually disintegrated. But if certain other forms of minute life are taken up by the amœba the digestive fluid in the vacuole is *not*, and the absorbed microorganism does not perish, but grows and kills its host. There are found in the bodies of the entire animal kingdom analogous, unicellular, amœboid organisms which originate in and belong to the tissues, named from their derivation mesodermal, and the discovery of analogous properties in these cells throughout the different animal species is the proof of what may sometime be surmised but not always demonstrated in man.

Investigation has shown that the same laws prevail throughout the whole animal kingdom. Even the very lowest forms of life, in which there is no nervous system and no closed vascular system, are afflicted with parasites, which are approached, ingested, and thus destroyed by the wandering, mesodermal, amœboid cells or leucocytes. If the parasites are not thus destroyed, the host perishes. A little higher in the animal scale the leucocytes begin to appear to be of more than one variety; they have different staining properties and different functions; some are phagocytic, that is, have the power of ingesting parasites, others are not so. In the mammalia the differentiation, as might be expected, becomes most marked. Man is known to be provided with two or at most three classes of leucocytes, which, as they appear to have distinct duties, require some description. The other varieties are as yet mainly of scientific interest and need only be mentioned. The hyaline leucocyte is phagocytic, exists most abundantly in and near the serous membranes, and has a single nucleus, which stains with basic, aniline dyes. The *finely* granular oxyphile cell is the ordinary pus-cell; it is oxyphilous, or stains with acid dyes, and is also phagocytic. The *coarsely* granular oxyphile cell or the cosinophile leucocyte, stains with acid dyes, is polynucleated but not phagocytic. Its properties are not, strictly speaking, proved, but are inferred from what is known about closely analogous cells in lower animals.

It is necessary now to return for a moment to the theories of Metschnikoff. The discoverer of phagocytosis believed that this process alone controlled recovery after bacterial infection. That it

fungus towards oak-bark, and its retreat from a substance like sodium chlorid. Then other low forms of life, including the unicellular amœba, were found to possess the same property of voluntary movement in approaching their prey or leaving a dangerous neighborhood. Observation speedily extended to the leucocytes or unicellular organisms in mammals, and their behavior in this respect towards bacteria.

If a capillary tube containing in its center certain microorganisms is planted under the skin of a rabbit it will speedily become filled with leucocytes, and in this instance the bacteria have positive chemiotactic properties. Other species of bacteria similarly implanted show negative chemiotactic properties—they repel the white cells from their neighborhood, and within certain limits this indicates that the animal in which this property is manifested will be overcome by the growth of the bacteria. But as it was observed that the fungus which was at first repelled by sodium chlorid can in time, by deprivation of water, be made to approach this substance, so, as regards bacteria and the emigrated leucocytes, can a negative be made to change into a positive chemiotaxis. Recent study has somewhat modified this view, in that now it is known that all bacteria exhibit, at the outset of their parasitic existence, a greater or less amount of negative chemiotaxis. The more speedily this changes to positive the better for the host.

Let me give an example of this change. It has been stated that the vibrio of Metschnikoff repels the leucocytes of a chicken into which it has been introduced, and that this is followed by the death of the chicken. If, however, the chicken is previously rendered immune to this vibrio and is then inoculated with a virulent culture, the usual negative chemiotaxis is found to have become decidedly positive. The chicken which would ordinarily die survives, and indeed manifests but slight evidence of disturbance. Metschnikoff was the first to show that the leucocytes which exhibit this positive chemiotaxis towards bacteria subsequently ingest and destroy them; and he believed that this destructive power of its leucocytes alone determined the survival of the animal. If the leucocytes were repelled from the bacteria and so could not absorb them the animal perished. The process is much more complex, as will be presently demonstrated. Comparative pathology has supplied the most of the light on this subject.

way in elucidating their functions. The frog is immune to anthrax. They found that anthrax bacilli suspended in frog's lymph were approached by leucocytes containing granules which stained with eosin. These granules were discharged and the bacilli apparently paralyzed or killed. The oesinophilous cells then withdrew, and were succeeded by mononucleated cells staining with methylene blue. These acted as phagocytes.

Thus something which had to do with the fluid part of the blood and tissue, or at least with the unformed elements, usually affects the bacteria before phagocytosis can occur. A well-known example of the power of this mysterious something is furnished by the clumping and loss of motility of typhoid bacilli in Widal's test for typhoid fever. The cell-free serum of an individual suffering from this disease, when mixed with a culture of actively moving typhoid bacilli, causes the latter within a few moments to cluster together in a mass, to lose their motility, and to perish.

All the antidotal serums are obtained from the blood of immune animals, and are now known to contain two substances, one of which is bactericidal alone, the other both bactericidal and antitoxic; that is, it destroys the bacteria and in addition neutralizes their products. These substances are of complicated composition, and have been compared by Behring to the electricity in a magnet. It seems impossible to isolate or measure them. They are not analogous to a simple antiseptic, for if they were, the more of an immunizing serum which could be administered to a diseased animal the greater ought to be that animal's resisting power. Such is not the case. Neither do these bactericidal and antitoxic substances neutralize bacteria and their poisons like an acid does an alkali; for if a guinea-pig and a mouse are simultaneously injected each with an equal amount of immunizing serum and tetanus toxin, the larger animal will die while the smaller will survive.

The immunizing body or bodies, as there are more than one, have been given the name of alexins. They are probably derived from the nuclein of the wandering and fixed tissue cells. By injecting a vegetable irritant into the pleural cavity of guinea-pigs Buchner obtained a germ-free, purulent exudate, more bactericidal than normal blood. Kossel has proved that when the nuclein is separated the residue of exudate loses much of its bactericidal power, but the solution of separated nuclein still possesses it in an active form.

is of great importance is shown by a simple experiment of much practical applicability. The guinea-pig is immune to inoculation with the spores of tetanus bacilli. Ordinarily the leucocytes approach and absorb them, and the animal recovers with but slight symptoms of disturbance. But if the spores are first encased in paper and then implanted in the pig, the leucocytes cannot come in contact with the spores, and the guinea-pig dies. A similar course of events can be supposed after infection of a mass of devitalized human tissue. The dead matter acts like a fence enclosing the bacteria. It prevents the latter from being reached by the wandering cells.

It is well known that debilitated persons are an easy prey to every kind of infection, and some of the earliest experiments clearly indicate that the general vitality of the individual is an important factor in phagocytosis. The chicken, for example, is immune to anthrax. The *spores* of this bacillus are taken up by the leucocytes, but seem very resistant; they are difficult of digestion, and they survive in the leucocytes a considerable time. If now the bird is immersed in cold water and its strength thus impaired, the spores begin to grow and destroy the phagocytes; eventually they kill the chicken. The white rat is similarly immune to anthrax. But if the rat is first made to turn a wheel until exhausted and is then inoculated, the result is the same in all respects as in the exhausted chicken—death. It was long doubted whether phagocytosis of living bacteria ever occurred; but now there is no question but that it does. It has been proved by numberless experiments; but the estimation of its importance has not been so easily settled.

One of the principal reasons for questioning the efficacy of phagocytosis as Metschnikoff understood it, was the fact that bacteria were often found to be dead before any leucocytes approached them. Then it was discovered that simple defibrinated blood had decided germicidal properties. The shed serum was actually more fatal to bacteria in many instances than that found in living tissues. Further experimentation demonstrated that the antiseptic substance of the serum was associated with the leucocytes; for an exudate rich in leucocytes was more bactericidal than the serum obtained by defibrination. This led to a study of these cells, and in the higher animals, as mentioned before, several distinct classes of leucocytes were identified. Kanthack and Hardy led the

In this connection it is well to mention the investigations of Hankin. Following the lead of Kanthack and Hardy, he claims to have seen the granules in the eosinophilous cells of a purulent exudate collect on one side of these cells and then disappear. Coincidentally with this disappearance of granules from the cells the bactericidal power of the serum increased. Enough has now been established to prove that at least some of the cells produce in presence of bacteria alexins or defensive proteids, which affect injuriously the bacteria before or in conjunction with the phagocytes.

As long ago as 1890, Tizzoni and Cattani stated that these defensive proteids were of the nature of an enzyme, or digestive ferment. The diatom contained in the vacuole within the amœba which devours it is destroyed by an acid fluid in this vacuole. The anthrax bacillus is similarly seen to disintegrate within a vacuole in a leucocyte of frog's lymph.

If attenuated anthrax bacilli are implanted in a glass tube under a rabbit's skin, many are found to be dead before phagocytosis has occurred. But both those within and those without the cells, dead and disintegrating in both instances, present the same general characteristics and reactions, and it is reasonable to suppose that the same agent destroys both the intra and the extracellular organism. That this is a ferment seems to have been proved by Leber. He excited an aseptic, purulent inflammation by inserting a sterilized copper plate in the anterior chamber of a rabbit's eye. This exudate freed of cells was then found to be capable of digesting proteid material.

Another rather noticeable analogy of the alexins with the digestive secretions of the body is furnished by the reaction of the blood in the course of an infection. Many experiments show that an increase in its alkalinity favors immunity, and Calabrese has demonstrated, by inoculation of susceptible animals with cultures of gradually increasing strength, that the alkalinity of the blood increased with each inoculation, and that it reached its maximum when the animal had become completely refractory to infection with the ordinary amount of the most virulent bacteria. Infection of susceptible animals showed there was at first an increased alkalinity, but this very soon subsided much below normal and remained so till death. It is probable, then, that the germicidal bodies of serum are only soluble or can only act in an alkaline medium.

Thus it has been shown that the liquids of an exudative inflammation have a manifold action. As a great part of the elements concerned in the combat with bacteria come from the vessels, the importance of the latter's share in the process is manifest. There is an experiment which emphasizes this fact. If the common femoral vessels in one leg of a rabbit are ligated and the leg below the point of ligation inoculated with pus cocci, a violent phlegmon and possibly gangrene results. Inoculation of an uninjured rabbit with a similar amount of the same culture produces only a localized abscess.

The fluid part of the exudate, then, flushes out the sewers, it carries off detritus, it supplies extra nourishment to the cells designated for repair and protects the system from invasion. The endothelial cells have some selective power on what passes by them. They remove or add certain substances to the plasma, and in addition have phagocytic powers. They can put forth processes and seize and incorporate bacteria, which, if they have escaped the emigrated leucocytes, are thus hindered from entering the general circulation.

The nervous system is intimately connected with all that occurs. But its action so far as known is as mysterious as ever. Beyond a few facts there is nothing definite. Histology has demonstrated that each cell of the heart has its particular nerve-filament, and as the heart is but a dilated vessel, it is presumable that each endothelial cell has its filament. Thus, with the aid of the central and peripheral vasomotor centres, the cooperation of the vessels in every inflammatory process is assured.

That the central nervous system does control to a certain extent the progress of events during a bacterial infection is shown by the following experiment. Divide the vasoconstrictor nerve in one ear and the vasodilator in the other ear of the same rabbit. Then inoculate both ears with the erysipelas coccus. The ear in which the constrictor nerve has been cut rapidly recovers, while the other undergoes gangrene and perishes. If, now, in a fresh rabbit all connection with the central nervous system is severed by cutting all the peripheral nerves of the ears, and the ears are then similarly inoculated, the inflammation still appears and runs its course. Hence the central nervous system is merely an adjuvant in the various phenomena. It is simply a modifier of the process, important but not

essential. The same may be said of the temperature which accompanies an infection. Nothing very definite is known about it.

I have thus attempted to show that an inflammation is nature's response to an injury; that anatomically the difference between the reaction to a simple traumatism and the reaction to bacteria and their poisons is more one of degree than of kind. It is all an attempt to overcome a disaster, and the greater the disaster the more workmen—the more reparative elements—are required. When there is much *debris* to be cleared away a greater amount of labor has to be performed, and the parts concerned show great activity. In a simple incised wound there is but little destruction of tissue, and a few wandering cells are scavengers enough. A slight congestion of the vessels supplies most of them and enables the fixed cells to repair the damage. A large contused wound requires greater activity.

The solvent power of the cells is exerted upon the necrotic matter of an aseptic wound as upon bacteria and their products. This is manifested clinically by the aseptic wound fever, as it is called. It is the manifestation of the absorption of the ferments generated in the solution and removal of the dead matter in an aseptic wound. Microorganisms provoke the same general response to the injury which they occasion. There is the congestion and swelling from the dilatation of the vessels and the exudation of plasma. With this goes the emigration of the leucocytes. There is always an initial negative chemiotaxis, although this may be of so short duration as to be scarcely perceptible. It is probably to allow the bactericidal substances, the fluid part of the blood, to at least weaken the bacteria. I speak of it as though there were conscious effort in the cellular elements, but I mean it in an evolutionary sense. It is a derivation of ages of cellular growth, combat, and development. Some of the wandering cells first approach and excrete a ferment. This may or may not be the same as that secreted by the phagocytes, which follow and absorb and digest both living and dead particles. The bactericidal action of the unformed elements and phagocytosis are two processes which go hand in hand; there is much doubt about the relative importance of each. But the general consensus of opinion seems to place phagocytosis in the secondary position.

This property of phagocytosis is possessed by the amœboid leucocytes of the blood and lymph, by many fixed cells, such as the endothelial cells of the vessels and serous membranes, by the epi-

thelial cells of the intestine, which can ingest the cholera vibrio, and by the cells of the splenic pulp. As soon as the destructive agency permits, repair by proliferation of the connective-tissue cells begins and proceeds as in an aseptic wound. Over all, with the mysterious general vitality which seems to be centered in it, is the guiding influence of the central nervous system.—*International, Feb. 1898.*

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HINTS BY A LAZY MAN. (1) You can buy prepared square cakes of pumice stone which are very convenient for cleansing the hands, polishing dirt off tables, and softening the stiff bristles on your chin before shaving. Only be sure and get it all off your chin before using soap and your razor. (2) After removing the bolts of your flasks, dip the screw in a bottle of oil convenient for the purpose, and they will always be easy for use again. (3) A first-rate laboratory bench-block may be improvised by securing on the table one of the rubber-tipped door-stops sold for the purpose of keeping doors from damaging the wall. They can be screwed into the table anywhere and in any position. (4) If your hands are dirty you will dirty rubber in packing sets, and the dirt remains, and even seems to penetrate deeper than the surface you wish to polish. The pumice block is a good thing to clean solid rubber before you pack. (5) A common soup ladle, with holes made in the bottom to let the water out, is useful to lift hot flasks out of hot water. (6) A small hoe, used to scale fish, is useful for scraping hard plaster from the bench. (7) Articulators and head-rests are two articles which the capacious brains of our mechanics should improve. (8) I never need rubber scrapers—hardly ever. If you prepare your pattern plate properly and are not too mean to buy well-made pattern wax, your plate should come out ready for the sandpaper. (9) Do not use oil or shellac varnish to keep the second part of the plaster from sticking to the first in filling flasks. Keep a pot of the soapsuds after soaping the plaster; run water over it. It will not stick. (10) You can buy at any hardware store a neat, round and cheap asbestos plate on which to put rubber when you are packing. Clean and convenient. (11) You can buy in rubber stores rubber fingers, which are useful if you have to finger foul mouths, and are just the thing to have on the finger of the hand which you use in the mouth when keeping the lips and tongue out of the way in extractions. (12) If you use beeswax or compound,

have it ready rolled in thin sheets to save time. (13) Sulphate of potash always kept uncovered loses its value for hardening plaster. (14) If you insist upon placing a porcelain crown, either with or without a collar, upon a very hollow root with an opening larger at the neck than towards the apex, do not use amalgam as a retaining cement around the metal pivot. Thoroughly dry the root cavity; wipe it out finally with the merest suggestion of oil of cazeput, then pack it tightly with warmed gutta-percha—not the pink used for pattern plates; heat the metal pivot; work it into the gutta-percha, packing as well as you can. I prefer it to anything else. (15) After operating for patient afflicted with pulmonary tuberculosis, sterilize your instruments, hands, etc., as carefully as if you had been operating for a patient suffering from syphilis. (16) Some of the trouble which occurs in the vulcanizing of dental caoutchouc is occasioned by a haphazard way of raising and retaining the temperature. If the directions advise you to keep the temperature at 315° Fahr. for one hour and a quarter, it is a mistake to keep it at 320° for an hour. In the matter of proper vulcanizing, the slow and sure method in heating and cooling is the best. (17) If you buy a new drug, do not use it until you know all that is worth knowing about its action and uses, and if a poison, its dangers and its antidotes. (18) A properly adjusted Auer light is away ahead of any electric light, if you are obliged to use artificial light at the operating chair. It is nearer the natural light of day than any other. (19) Keep your dental engine, chair and spittoon covered from dust at night. Do not use too much oil. Dirt is the bane of the dentist. (20) If you have rough hands from handling flanks, etc., wash well with hot water and soap when going to bed; rub vaseline on them thoroughly, and pull on a pair of large-sized gloves. Too lazy to say more just now.—*Dominion Jour. Jan. 1898.*

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CARE OF VULCANIZERS. In spite of the fact that the vulcanizers sold by reliable manufacturers are submitted to severe tests by hydrostatic pressure—some of them to a pressure of nine hundred pounds to the inch—explosions have not been infrequent, generally due to the ignorance of the assistants who watch them, or pretend to watch them, during the process of vulcanization, and not a little to the carelessness of the dentists themselves, who fail to impress upon the students that these little steam boilers require as

much attention as boilers of a greater capacity. In the first place, it does not pay to use cheap vulcanizers any more than cheap German tools and instruments, or the cheaper grades of artificial teeth. In the next place, one should familiarize himself with every part of the machine; realize the importance of keeping it and its belongings clean, and adhere strictly to the rules laid down by the manufacturers. Where thermometers are used it ought not to be forgotten that too rapid and too great heat at starting, especially if the flame is allowed to surround and reach the top cover, may deceive, and that the thermometer at 320° may really indicate only the temperature of the cover and not that of the flask inside. The safety disk used on some modern vulcanizers should not be forced on too tight, as this weakens them. The boiler should on no account ever be perfectly full of water: at least, one inch or more of steam room should be left above the water. When the heat is first applied, the valve for the escape of steam should be opened for a few minutes to allow a free escape of steam, as this leaves in the boiler, after the valve is closed, an atmosphere of pure steam, and precaution should be taken not to use any more force in closing the valve than is necessary to make it steam-tight. We are warned, too, not to daub too much blacklead or soapstone powder about the packing. In fact, it is better never to use any if it can be avoided. Oil should never be used, as it rots the rubber packing and may become gummy and cement the core to the pot, to the damage of the rubber packing. Too frequent use of the blacklead and soapstone wears away the screw thread. In heating up, the flame should not be larger than will cover the bottom of the boiler. If students can have these simple instructions put into their brains, it may save some of them from having their heads blown off. If they will not attend to them they deserve to be killed. Thermometers, in the cities, ought to be relegated to the list of things which are obsolete in the laboratory. Proper gas regulators and steam gauges should be used and dentists owe it to themselves and their students not to neglect every proper precaution in the use of these laboratory demons.—*Dominion Dental Journal, Jan. 1898.*

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ITEMS FROM B. H. TEAGUE, D.D.S., Atlanta, Ga. *To Crown Hollow Roots.*—When a very "hollow" root presents for a pivot-crown, fit the latter as best you can after filling the root, then lay aside. Roughen the thin walls of the "hollow" where there is least

danger of perforation. Now insert a soft wood pivot whittled to the shape and size of the metal pivot in the crown and around it pack amalgam to the margin of the gum. When it becomes hard drill out the wood and place the crown, which may now be done easily and satisfactorily.

Separating Cast from Wax.—If in separating bite-plaster casts from the wax, the plaster teeth are broken and scaly, flow thin cement over the fragments left in the wax and replace the cast in the bite. When the cement hardens, separate carefully and the cast will then be perfect.

For Irritated Gum.—The transparent amber-colored oil-cloth of the drug-stores is a very serviceable material to put between the gum and irritating regulating fixtures.

Best Engine Band.—The most serviceable engine band is the steel spiral spring band.

Waste Receptacle.—Get in the habit of putting waste cotton, bibulous paper pellets, worn disks and ligatures into a small box, basket or vase placed on the cabinet, and stop littering the floor around the chair.

Glycerin Lubricant.—Glycerin is better than water to "wet" a diamond drill with, when cutting enamel or drilling into an artificial tooth.—*American Dental Weekly, Jan. 1898.*

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CASE OF HÆMATOMA. By J. H. McCutchan, M. D., Evansville, Ind. E. C——, aged twenty-five, good physical condition, no syphilitic history, family history good, complained of bleeding at the mouth, loss of appetite, headache and constipation. On examination of the mouth the gums were found to be covered by numerous, well-defined hemorrhagic tumors, varying in size from a pinhead to one-eighth of an inch in diameter; on further examination these hemorrhagic tumors were found to extend back over the palate and pharynx. The rest of the body was well nourished and normal in appearance; no other abnormality could be discovered at that time. The tumors were cauterized and the patient was put upon tonics, astringent preparations and iodids. Under this treatment he seemed to recover—the bleeding stopped, the tumors disappeared and the headache ceased. After a week's respite, however, these abnormal conditions returned in intensified form, the tumors appearing not only on the gums, palate and pharynx, but also on

the trunk, arms and hands. Treatment availed nothing. At the end of two weeks the patient had an attack of hemiplegia involving the entire left half of the body. Speech was unimpaired and the mental faculties were retained, but there was entire loss of motion, together with partial loss of sensibility. The patient was placed upon large doses of the iodids, which seemed to have a very happy effect, but only temporarily, as he lapsed into a comatose condition and died two weeks after the paralytic attack. The post-mortem examination revealed an extensive hæmatoma involving the whole motor area of the right cerebral hemisphere, the brain substance in close proximity being broken down and degenerated, while over the entire brain surface were scattered small hemorrhagic tumors corresponding in size to those found on the gums, palate and pharynx.—*Medical Record, Feb. 1898.*

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CARBOLIC ACID. By Dr. A. L. Benedict, Buffalo. Pure carbolic acid is a white, crystaline solid, of characteristic pungent odor. For convenience a small amount of water (5 per cent) is usually added so as to melt the crystals. With larger proportions of water an emulsion is made until the carbolic acid is reduced to 5 per cent, when the solution is again perfect. That is to say, the carbolic acid takes up a small percentage of water, and water a small percentage of carbolic acid; neither will dissolve with a large proportion of the other.

From the development of rosalic acid, carbolic acid which has been kept for some time, unless air is absolutely excluded, becomes red in color, but this change is of no practical importance.

Carbolic acid is a poison to protoplasm in all forms. Thus, it is antiseptic and in strong solutions absolutely germicidal; it is also destructive to animal tissues. It forms whitish sloughs wherever the strong acid comes in contact with the skin or mucous membrane; it corrodes the stomach; reaching the kidney in diluted form it causes congestion and often actual inflammation, with dark greenish urine, as in poisoning by any of the aromatic organic compounds, having the radical C_6H_5. About a teaspoonful is said to be necessary to cause death of an adult, but much smaller doses have produced serious kidney trouble and dangerous immediate symptoms. Being very soluble it is easily absorbed, so that surgeons have noticed unpleasant symptoms from using it as an antiseptic, and fatal

results are said to have resulted from its use in weak solutions to wash out the stomach or other cavities of the body. Like almost all antiseptics which are at the same time powerfully irritating, carbolic acid is a local depressor of nerve tissue. Surgeons frequently noticed, while this drug was in vogue as an antiseptic, a numbness of the fingers, especially along the opposed surfaces, where the skin is thin. Thus, the numbness may give the peculiar sensation of being web-fingered.

In using carbolic acid in any cavity of the body, or on any surface where it is kept long in contact, attention must be paid not only to the strength of the solution but to the total amount present. Twenty centigrams, or about five drops, is a fair internal dose, and not more than twice this quantity should be used, unless for practically instantaneous contact, when we can be sure that the excess will be removed. For external use, cleaning instruments, etc., a solution strong enough to have much value as an antiseptic within a reasonable period of time cannot be tolerated by the hands. Small instruments, however, may be immersed in carbolic acid containing 5 per cent of water, and can thus be disinfected in a few minutes.

In dentistry carbolic acid is used as an antiseptic, an anesthetic (local), a caustic (to close the tubules by making an albuminous film), and a stypic (through the same action).

Antisepsis in dentistry is certainly of great importance. Since Miller and others have shown the practical relation between bacteria and dental caries, it may be held as malpractice to convey bacteria from one mouth to another in which a cavity is being cleared for a filling. An amalgam filling has some active antiseptic power, but a filling of gold or silver can scarcely have more than a mechanical action in preventing the progress of caries, and it may be that the decay at the periphery of such a filling is due to lack of antiseptic precautions on the part of the dentist who cleared but did not clean the cavity. The application of pure carbolic acid to a cavity, just before inserting the filling, is good practice, both from the need of antisepsis and the indications for closing the tubules, obtunding the nerves and checking such hemorrhage about the base of the tooth as may have been caused by the slipping of an instrument. Still, it is questionable whether oil or cloves of cinnamon, or almost any other aromatic oil, would not be preferable. For disinfecting instru-

ments, the best method is boiling in a weak solution of soda, solutions of carbolic acid being inefficient unless after prolonged soaking. To disinfect a foul cavity or for use in the mouth generally, hydrogen peroxid (25 to 50 per cent of the 15 volume solution) is better and safer than carbolic acid, acting to oxidize the bacteria present as well as their poisons. The use of hydrogen peroxid to bleach the teeth is now well known. Formaldehyde, a recent favorite, is one of the most active antiseptics known, but it is irritating and even painful if used on a raw surface or on a mucous membrane. Of the standard solutions, containing 40 or 50 per cent of gaseous formic aldehyde, a one or two per cent dilution may be used in the mouth.

It may be said, on the whole, that while carbolic acid is a useful application in dentistry, there is scarcely an occasion when something better, or at least more elegant, may not be substituted for it. The pain of operating is due very largely to overheating, from the too continuous use of the drill, or the too rapid stroke against the filling. If the dentist is careful never to allow his instruments to become hot he will inflict very little pain, and will need a local anesthetic only in rare instances—and then it is difficult to say where he will find one that is thoroughly satisfactory.

Physicians are frequently called upon to stop a toothache until a dentist may be consulted, and it may be that dentists themselves can profitably use measures which will allow a supersensitive tooth to regain a condition of comfort before the radical relief of the decay is undertaken. Carbolic acid might be used on cotton for this purpose, and, being less treacherous, is to be preferred to a solution of cocain, which may cause sudden faintness from very small amounts. Oil of peppermint, cloves, etc., may be used for the same purpose and are superior to carbolic acid. Sometimes a patient has a violent antipathy to one or more aromatics, but may be willing to use another. Thus it is well to keep several essential oils on hand. I have occasionally used a mixture of about equal parts of tincture of iodin, oil of peppermint (or alcoholic solution of menthol), oil of wintergreen and carbolic acid. The possibility of damage to tooth structure by iodin must be considered, though most dentists consider it harmless. Usually, too, the carbolic acid may be omitted without loss of efficacy. Such anesthetic and antiseptic mixtures are applied on cotton, forming a temporary filling.

It must not be forgotten that the merely topical remedies which are used in dentistry may be swallowed or absorbed, and thus produce serious constitutional complications. This is especially the case with such powerful drugs as cocain, opium, arsenic, and especially carbolic acid. Without doubt there have been many instances of nephritis, of gastritis, and of various functional disturbances due to capillary congestion caused by the too free use of carbolic acid in the mouth. It should not be forgotten that many patients are idiosyncratic, and that doses of some toxic remedies that would not be appreciated at all and would produce no effect on some people, on others induce the gravest symptoms, and carbolic acid or preparations of mercury are amongst the most active of them. For these reasons, and because the former is such a violent irritant, its use should, whenever possible, be avoided by dentists, and as it is almost exclusively employed as an antiseptic, some other preparation can readily be used in its place. Of course, when its obtundent effects are desired, the amount necessary is so small that only carelessness would cause injury by it.—*Dental Practitioner, Jan. 1898.*

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ETIOLOGY AND TREATMENT OF GLANDULAR ENLARGEMENTS IN THE NECK. By A. G. Miller, M.D., Edinburg. It is a marvel to me that in these days of investigation and discovery of organisms and other causes of disease, the very common, evident, and in many instances easily removed causes of glandular enlargements in the neck are so often ignored, or at any rate overlooked. I have seen many cases in which the removal of a bad tooth, or the curing of a chronic pharyngitis or tonsilitis, would have prevented gland trouble and saved much disfigurement. *Causa sublata, tollitur effectus.*

There are many varieties of glandular enlargements, but I shall refer to only two—the *simple chronic* and the *tubercular*. I have selected these because they are the most common, because they are often difficult to diagnose and differentiate from one another, and because they best illustrate the subject of my paper. Before dealing specially with the *etiology* of gland enlargements I shall say a few words on *diagnosis*.

Simple enlargements are not usually discovered nor advice sought on account of them until they have existed for some time. The patient is usually a child; often delicate looking, but sometimes

quite healthy otherwise. On examination one finds one or more lumps of an almond shape, firm but not very hard, not sensitive, freely movable, enlarging very slowly, and with a history perhaps of an acute or subacute attack of inflammation. Sometimes the invasion is insidious.

Tubercular disease of glands on the other hand has three distinct stages. In the first stage the condition is similar to what I have just described. In the second stage softening takes place (caseation) of one or more of the glands when they become matted together. In the third stage there is further softening (liquefaction) and fluctuation can be made out. The skin then becomes adherent, discolored and thin. The abscess, so-called, points, and if not opened, discharges its contents on the cutaneous surface.

Tubercular disease is readily recognized in the second and third stages, but in the earliest stage it is not easily diagnosed from simple nontubercular enlargement. Indeed, it is sometimes impossible to differentiate the two, because any simple chronic adenitis may become tubercular, and a tubercular affection may commence as a simple adenitis. If this be true it brings out a fact of great practical importance, viz., that there is a *pretubercular stage.* Personally I am firmly convinced that there is a pretubercular condition in many cases; and I am sure that a very large proportion of the cases of tubercular gland disease that I have seen might have been prevented by the timely discovery and removal of a carious tooth or some other cause of gland irritation.

It will make things easier if we now consider the anatomical relations of the cervical glands to the various parts of the head, face, and neck from which they derive their lymphatics. I have found it convenient to divide these glands into the following groups which differ slightly from the groups given in anatomical works: (1) Those at the back of neck—*occipital* group. (2) Those behind the ear—*mastoid* group. (3) Those in front of the ear—*parotid* group—which may be again divided into the *superficial* and the *deep.* (4) Those under the jaw—*submaxillary* group. (5) Those lying along the sterno-mastoid muscle—*sterno-mastoid* group—which may also be conveniently divided into the *superior* and *inferior*. (6) Those above the clavicle—*supra-clavicular* group.

These various groups of glands receive their lymphatics as follows (so far as I have been able to make out): The occipital from the

posterior part of the scalp; the mastoid from the scalp and ear; the parotid from the front of the head, the ear and several other parts. This group, however, requires further differentiation, and therefore I have divided it into the superficial and deep parotid groups. The former glands are served by vessels from the front of the scalp, the external ear and meatus; while the latter are connected with the orbit, nose, pharynx, middle ear and upper teeth. The submaxillary glands derive their lymph from the cheeks, lips, mouth and lower teeth. Of the sterno-mastoid groups, which, along with the submaxillary glands, are those most frequently affected, the upper series is connected with the tonsils, pharynx, esophagus and larynx; while the lower ones are related to the deeper structures, and are generally found to become affected secondarily to the upper ones. The last group (supra-clavicular) is connected with the intra-thoracic and axillary glands, and derives its lymph from thoracic regions mostly. (The superficial (subcutaneous) glands are connected with the skin, and are affected by cutaneous irritations such as boils, etc.)

The clinical importance of this grouping will be evident if we take some examples. A child has its occipital glands enlarged or suppurating. Employing the above classification as our guide, we at once examine the back of the head, and will most likely find some eruption or pediculi, or both, as the cause. If the posterior auricular glands (mastoid) should be affected, we examine the scalp and external ear. If the submaxillary glands be inflamed, we look at the lips and into the mouth for the source of irritation. If the glands in the upper cervical region be enlarged, there is a much wider range of investigation opened up. We may find the cause in the nose, throat, or middle ear. Once more, if the glands in the lower cervical region be affected, we will probably find, after investigation of the other groups of glands, that the upper cervical, or mediastinal, or axillary glands have been diseased first, and that the irritation has spread by contact to those lower cervical and supra-clavicular groups. I have noticed tubercular disease of last-named glands associated with oldstanding, quiescent, or to all appearance cured, phthisis.

Having demonstrated the importance and clinical bearing of the anatomical arrangement and relations of the cervical glands, we are in a better position for discussing the *etiology* of glandular affections.

Causes in my student days were usually classified into predisposing, exciting and maintaining. In the present day they are apt to

be disposed of under one term, *organisms*. Without desiring to undervalue in any way the influence of germs, I shall adopt the old-fashioned method at present as being more convenient.

1. *Predisposing causes* of glandular enlargement in the neck certainly exist. I shall refer to two, childhood and constitution or heredity. No one can deny that children suffer from gland affections more than older persons, and whatever explanation may be given or definition offered of the terms "constitutional proclivity" and "diathesis," there can be no reasonable doubt that some persons are more liable than others to gland affections, and also that this tendency seems to "run in families."

2. *Exciting causes* might almost be classed under the one head *organisms*. But we cannot get rid of the matter thus easily, for the question naturally arises, how do the organisms obtain access to the lymphatic glands? In answering this question we have to consider two points—first, the organisms (or their products) have to be absorbed by the lymphatic vessels; and second, there must be a favorable surface from which absorption can take place. These conditions are usually supplied by broken skin or mucous membrane, an inflamed surface, or a lodgment in some "pocket" or cavity of septic decomposing matter. I have already described how such open doors are provided — a scalp eruption, a carious tooth, adenoids, tonsilitis, pharyngitis, middle ear disease and so forth. These various pathological conditions provide the organisms, their products, and the surface capable of absorbing mischief. The natural function of the lymphatic glands is to receive the absorbed materials, to filter and make them innocuous. When this is accomplished all is well, but sometimes the septic poison is too strong, or the glands fail in properly performing their function, and then we have glandular infection, irritation and inflammation. We may say, then, that the exciting causes are organisms and their products, plus those conditions of mucous membrane, teeth, etc., which favor their lodgment and absorption by the lymphatics.

3. I now come to the third class of causes, and to this class I wish to draw special attention. The *maintaining cause* of glandular affections is often the persistence of the exciting cause as I have described and defined it. Remember that I am speaking of simple chronic and tubercular gland affections in the neck. These would not exist at all were there not some maintaining cause. A tem-

porary inflammatory enlargement often appears and disappears along with the primary cause. If the infection be intense or the glands weak, the irritation may lead to suppuration—the gland is destroyed, suppurates out, and there may be an end to the matter. If, however, a gland once irritated remains enlarged, refuses or is unable to recover, there must be some explanation, some cause of this. This cause I call the maintaining cause, and the maintaining cause is not infrequently the exciting cause unremoved. Let me press the argument yet further. Seeing that the organisms and their products cannot obtain access to the glands without an open door such as I have described, I take it that the real maintaining cause is the open door. Let me illustrate this. The glands of the neck become enlarged in connection with a tonsilitis or pharyngitis. If these conditions be cured the glands will recover of themselves. Again, the glands under the jaw are enlarged and painful in connection with a bad tooth. Let the tooth be extracted and the glands will cease from troubling. The irritation and enlargement of the glands disappear when the cause and source of the irritation are removed. But if the irritant be not removed the irritation is continued, the glandular enlargement persists or gets worse, and the patient suffers from chronic glandular enlargement.

Now this raises two points which must be dealt with. (1) In some cases glandular enlargements (chronic adenitis) remain after all apparent cause has disappeared. (2) Some cases persist after the cause is removed and the open door properly shut. Examples of these conditions (which are practically the same) are common in the experience of all, I am sure. In the former the tonsilitis or pharyngitis has had time to disappear, but the glandular irritation (or its effects) remains. In the latter case the tooth is extracted or the adenoids removed, but the glandular enlargement persists.

The explanation is the same in both cases, viz., some irritating factor has lodged in the gland itself, which the gland cannot destroy or expel, possibly on account of its natural inability to do so. That factor, I take it, is an organism, usually the tubercle bacillus. It has entered by the open door and refuses to be expelled—it has come to stay.

This brings up another interesting point. *Persistent glandular enlargement after removal or disappearance of all discoverable sources of irritation may mean that the glands have become tuber-*

cular. This, if true, is a most important fact. I have become convinced of it both by the course of reasoning which I have just detailed and also by my experience. Let me put it in this way. Is there doubt and difficulty in deciding as to whether, in a given case of glandular enlargement in the neck, the condition is simple or tubercular? If, on careful investigation, no evident source of irritation be found, or if some irritating cause has been discovered and removed, and yet the glands do not improve, then the presumption is that the glands are tubercular, or are at least in the pretubercular stage to which I have referred previously. Going back then to *maintaining causes* I would narrow them down for practical clinical purposes to two, the *open door* and the *tubercle bacillus.*

That brings me to my "practical application," in other words, to treatment. What I have to say will be very brief. (1) In all cases of glandular enlargement in the neck look for the cause and treat it, or have it removed at once, and generally the glands will get well of themselves, or with the help of some simple local application such as a carbolic compress. Many patients have been sent to me for excision of glands, whom I have been able to send home in a few days well or nearly so, after the extraction of a stump or removal of some such source of irritation. No local treatment is appropriate or of any avail so long as there is an irritating cause present. Remove the cause and the glandular enlargement will disappear. (2) Secondly, if all visible cause has been removed or has disappeared, and yet the glandular enlargement remains, *remove the glands*, even though you may not be quite certain that they have actually become tubercular. So long as there is chronic glandular enlargement there is risk of tubercular infection. My experience has been that, when glands have been removed "on suspicion," they have almost invariably turned out to be tubercular. I do not think it is safe to wait till one is perfectly certain. By that time, in all probability, more glands will have become infected, and the operation of excision will, when performed, be more severe, while the possibility of extirpating the whole disease will have become more doubtful.—*Brit. Jour. Dent. Sc., Feb. 1898.*

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NECESSITY FOR HIGHER EDUCATION IN DENTAL MATRICULATES. By Frank L. Platt, D.D.S., San Francisco, Cal. Read before the S. F. Dental Association, Nov. 8, 1897. "A

little learning is a dangerous thing;" and the greatest danger threatening the dental profession to-day is the little learning possessed by many of its members. We note the progress our profession has made in the last three-quarters of a century, and point with pride to the fact that in the same length of time no other liberal profession has kept pace with it in either general or special advancement. We see the gradual progress from the barbershop era of tooth-extraction to the establishment of dental colleges and the acceptance of dentistry as an honored and enlightened profession, second to none of the great branches of the healing art. All this is most commendable, and our pride of accomplishment may be pardoned by a charitable laity; but when we look about us and see how many fellow-practitioners we have of whom we are not proud; of whom we speak only in terms of derision or reproach, or, better yet, speak not at all; when we see the columns of the daily papers filled largely, as they are, with nauseous descriptions of public and private immorality, and the vicious advertisements of medical quacks, and find there prominently displayed in fitting company emblazoned announcements of the "dental parlor" with its "painless dentistry;" when we see our honored and much-abused profession prostituted to the level of one of the attractions in a modern department store, we cannot blame those who look upon dentistry as a trade, and view with more or less suspicion the followers of our calling.

We may indeed be proud of what our profession has done, in spite of all the obstacles with which it has had to contend, but we cannot but realize that something is fundamentally wrong with our system of dental education and practice of conferring degrees on men whose sole ambition seems to be to make what money they can out of their profession, regardless of how they drag in the slime of quackery what they have received and should regard and cherish as a sacred trust. But few, if any men of liberal education are to be found among the disreputable practitioners of dentistry. Success in professional life comes to an ignorant man only when he preys upon the ignorance and credulity of others. Deprive him of the support of the unthinking and the ignorant and his degree and diploma become but the worthless embellishments of a misdirected ambition.

There is no reason under heaven why an ignorant man or woman should be admitted to or graduated from a dental college, excepting that the college wants the fee and has so dwarfed its conscience that

the glitter of the matriculate's gold is brighter and more desirable than the honor and welfare of the profession it is supposed to uphold. Yet hundreds of utterly unfit students are graduated from our colleges every year; "dental parlors" increase and flourish, and everywhere reputable dentists are asking for a remedy.

Gentlemen, if only those students who have graduated honorably from a high school or similar institution of learning were allowed to matriculate; if all those who come before our state boards of dental examiners for licenses had to possess equal qualifications and to serve a three-years' apprenticeship with a reputable practitioner, the members of our "dental-parlor" brethren would diminish as rapidly as a kind and beneficent death would remove them from the scenes of their activity, or as would grow the respect and esteem in which our profession is held by all those whose opinion is worth having.

The success of quackery is its greatest encouragement, and while a non-discriminating public, reasoning only on a basis of cost when considering a dental operation, will lend its patronage to practitioners of ill-repute, so long will there be encouragement for others to join the ranks of those already without the pale of honorable association in their profession.

There never has been a time in the whole history of dentistry when more earnest work was being done, or more effort in every direction being made to advance the truly scientific branches of our art than at present. At no other time has so much been done to establish the correct relationship between the cause and effect and prevention of dental disease; never has dentistry been more deserving of the title of a learned and liberal profession than it is to-day; nor has there ever been a time when the quackery and the ignorance of many of our practitioners—graduates of dental colleges, if you please—has been so much of a reproach and disgrace. There are to-day about thirty thousand dentists practicing in the United States, and how many of them, let me ask you, are known anywhere outside of the little circle which bounds their daily lives. The names of a few are common to all of us, but the great mass of practitioners are unknown to the worlds of dental science and dental literature.

Almost one-seventh of the whole number of dentists belong to dental societies. Only one-seventh of all our fellow dentists are large-minded or liberal enough, or feel themselves sufficiently educated, to belong to their local and state organizations. And this state

of affairs, lamentable indeed, bespeaks but two things: the lack of broad and liberal education, and the enthusiasm and culture such an education gives. There are several dentists in San Francisco who have told me they would not join this society because they "could not write a paper," and "would not know how to do anything" if they did join. They are to be pitied rather than censured; they are good fellows and good dentists, perhaps, but they are living examples of the lack of education in the dental profession.

This question is serious and of vital importance to the future of our profession. If we are to keep pace with the scientific advancement of the day and keep dentistry in the front rank of the march of the liberal professions, we must educate men to a degree that will fit them for this work. We cannot equalize the natural endowments of all men, but we can, if we will, enforce upon them, from a theoretical standpoint at least, an equal start in the race for professional supremacy. I believe a time will come, and may I live to see it, when the degree of Doctor of Dental Surgery must be preceded by that of Doctor of Medicine, and these preceded by the degree of Bachelor of Arts.—*Pacific Medico-Dental Gazette, Feb. 1898.*

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RELATION OF GENERAL MEDICINE TO THE SPECIALTIES. By Frank Billings, M.D., Chicago. Read before Chicago Medical Society, Jan. 18, 1898. Twenty years ago it was the rule to find in medical schools the following chairs: Anatomy, Physiology, Chemistry, Materia Medica, Pathology, General Medicine, General Surgery, Gynecology and Obstetrics, and Diseases of the Eye and Ear. As our knowledge of medicine and surgery has advanced these various principal chairs have become divided and again subdivided until a modern American medical school has thirty or more chairs, filled by as many professors. In the fundamental branches this has been necessary and of great good to the advancement of medical knowledge. Histology, physiological chemistry, bacteriology, special pathology, surgical pathology and general and special therapeutics are some of the offshoots of anatomy, physiology, chemistry, materia medica and pathology. These special chairs became necessary as our knowledge increased. Important as these special studies are individually, they are but parts of the fundamental branches of medicine and should never be studied entirely separate and alone. Physiological chemistry is a part of chemistry

and of physiology; histology, normal and pathological, a part of anatomy and of pathology, respectively; bacteriology a part of pathology, and so on through the list. A full knowledge of the fundamental branch implies an equal familiarity with the special subject related to it.

I think no one will dispute the fact that the fundamental studies of medicine are more thoroughly taught now than formerly. The student is better drilled and is taught in a more rational way. There are faults, very gross ones, which still need correction. Specialism in the fundamental studies is too often separated from the main subjects and the relation between them is lost. Bacteria are properly studied in the laboratory as interesting individuals or families, and important and necessary as this special study is, it is practically worthless to the student if he is not taught how the bacteria may affect animals, what chemical changes and anatomical lesions may be produced by them, and the result of these bodily changes upon the animal.

The so-called practical branches have also been divided and subdivided. General surgery has had separated from it the surgical diseases of women, orthopedic surgery, venereal diseases, diseases of the skin, diseases of the nose and throat, rectal diseases, and there are so-called experts or specialists in abdominal surgery, brain surgery, etc. General medicine has been shorn of mental and nervous diseases, of diseases of children, of diseases of the stomach, of the kidneys, of the lungs and heart, etc.

On the whole this division no doubt has been a wise one, and has been made because the teachers found it the best means of drilling students. The result has been in many ways good. The graduate has commenced practice with a better knowledge of special subjects than in years gone by. His knowledge of how to do his work is better than formerly. He will recognize a kidney, a heart, a lung or a stomach disease with his instruments of precision in diagnosis better than his brother of twenty years ago. His education has been special in many ways, and often at the expense of a general knowledge, as I shall try to show. This is one of the faults of the modern method of medical teaching.

Formerly much time was spent upon the principles of medicine and surgery and these principles were applied to all the specialties which now exist as parts of general medicine or of surgery. The

division of the principal chairs and the assignment of hours for the purpose of teaching the specialties resulted in two things: First, the curtailment of the time formerly alloted to general medicine and to general surgery; and second, the necessity of lengthening the college course to make sufficient room for the special teachers. The abbreviation of the time given to the general subjects necessitated, or at least resulted in a change of the method of teaching. The principles of medicine and surgery now receive but scant notice. The time assigned to the teachers of the general subjects is filled by a simple description of the individual general diseases assigned to the teacher. In other words, the general teacher has become a specialist in a sense. Even the books upon general medicine and surgery have changed in the same way. The writers of most of these books confine themselves to the special cause, morbid anatomy, clinical course, diagnosis and treatment of individual diseases.

We may say that the time now given to the fundamental branches makes it unnecessary any longer to teach principles. I think this is not so. To understand the principles of medicine and of surgery it is not only necessary to have a good knowledge of chemistry, anatomy, histology, physiology and pathology, but, as mentioned in the first part of this paper, the student should understand the principle of the relation of these fundamental branches to each other—their mutual interdependence. As for instance, the chemistry, histology and physiology of alimentation in health and disease, in relation to nutrition, heat production, heat loss, auto-intoxication and excretion from lung, skin, bowel and kidney; again, the anatomy, histology, physiology and chemistry of the blood and lymphatic circulatory apparatus and of the blood and lymph in health and disease, in relation to every organ of the body. Principles of which the above are examples abound in medicine and surgery. It is probably true that the student has been taught all of the essential facts concerning alimentation in health, and he may know all about heat production in health, but what about alimentation in disease? Of diet in fever and in the various chronic diseases, in relation to heat production and as compared with the various physiological processes of health? What relation has a noncompensated mitral valve lesion to the other organs of the body, what is the morbid anatomy of the affected organs and what result has the altered functions of these organs upon one another and

upon the whole organism? Will a student who is taught isolated facts or theories correlate them? A few may, the many will not.

As mentioned above, the medical college course has been lengthened by all good schools. Why? On the surface it appears to be because the profession is advancing and demands better college teaching. This is no doubt true. However, there is another reason found in the fact that so many chairs have been added that it became necessary to make more time, which could be divided like the principal chairs and filled by specialists. More accurate knowledge is thus given to the student, but given in what form? Usually as propositions, true or false, dependent upon the special teacher's belief in certain theories, tried or untried. Students are thus stuffed with so-called facts, supported too often by no fundamental principle, which they must memorize for examination and then forget.

Our so-called improvement in medical schools is therefore true in a limited sense only. The student is well grounded in the individual fundamental branches of medicine and surgery and he receives more clinical instruction than formerly. But as to the principles of medicine and surgery, which are absolutely necessary to a broad and comprehensive knowledge of medicine and surgery, he is wofully deficient. In place thereof he has a smattering knowledge, a few memorized facts or falsities of medicine, of surgery and of the specialties. His teaching has not been comprehensive enough in any one of these branches to make him a specialist, and he is a poor general practitioner because the principles of medicine and surgery are unknown to him.

Furthermore, this method of teaching has stimulated many students to select specialties at the beginning of their practice. A student will even announce his future specialty when he enters the medical school. The result can be easily guessed, and in fact it may be seen every day in the enormous number of specialists in every limited field.

Formerly most specialists practiced general medicine or general surgery for years before adopting a narrower field. I remember when I was a medical student to have heard many times repeated that the people made the specialist; that success while a general practitioner in a certain field made a gynecologist, made a specialist of diseases of the eye and ear, made a nose and throat specialist

or made a stomach specialist. I believe the doctor is a better special practitioner because of the practical knowledge gained as a general practitioner.

I think the above statement can be verified and will be confessed by every physician or surgeon who sees many patients and who meets many of his colleagues professionally. We may all make mistakes and our judgment may be in error, no matter what our experience and knowledge, but the mistakes one sees made daily by men in special practice are too often the result of a limited general knowledge and experience. This statement applies of course more fully to the chronic than to the acute diseases.

It is probably fair to state that the great majority of the chronic diseases which we meet, especially in our office patients, are caused by bad hygiene. I use the word in its broadest sense, which will include under it the history of the daily life of the individual. The poor are exposed to the evil influences of poor food improperly prepared for the stomach; imperfect protection from weather changes because of inadequate clothing and badly constructed dwellings; vitiated air in tenements and in the places of work, and overwork of both children and adults. The well-to-do and the rich eat selected and perhaps well-prepared food, but too much of it, or take rich, indigestible material; live in overheated, poorly ventilated houses in winter; take little or no active exercise, and with late hours for pleasure at night and late hours for the sluggard's sleep in the day.

Then the habits of all civilized mankind, both rich and poor, of over-indulgence in alcoholics, in tobacco, in tea, coffee and other stimulants; the worry and fret of mankind over personal griefs, the strife of competition and struggle for a living or for a social position of influence in the community must all be taken into consideration.

These are some of the factors which undermine the general health of the individual and produce dyspepsia, constipation, malassimilation, malnutrition, auto-intoxication. This state aggravated by the continued evil habits or surroundings of the patient may lead to the chronic diseases of the vascular system and this in turn to sclerotic changes in any or all the organs of the body and probably in the cord and brain. In this state of malnutrition and auto-intoxication, catarrhal inflammation of the mucous membrane or possibly of the skin may occur through the agency of bacteria which

find a proper soil for development in or upon such weakened tissues. When once under way, a resulting local process may aggravate the complex whole and appear as the primary cause. Indeed, a local disease may and does sometimes produce a general disturbance similar to that which I have described. But in the great majority of cases the primary cause will be found to be some unhygienic state, the correction of which is necessary to the recovery of the patient, even if it be also required at the same time to wash out the stomach, curette and replace the uterus, fit glasses to the eyes or remove a cluster of hemorrhoids.

How can one know these truths except by experience as a general practitioner? And yet one finds specialists of the kidneys who do not treat diseases of the cardio-vascular system or of the digestive system; specialists of the throat and nose who do not study the blood states or the nutrition of the patient; specialists of diseases of the skin whose knowledge of the digestive and excretory organs is limited; specialists of the ear who do not treat diseases of the post-nasal space and pharynx; specialists of the eye who cannot or do not recognize the effect of many of the general diseases upon the eye, its nerves, or upon the brain; who do not recognize general conditions, as for example, malnutrition, neurasthenia, etc., and the resulting effect upon the refraction of the eye; specialists of the digestive tract who know nothing of the nervous system or of nervous diseases, of diseases of the lungs or of the circulatory apparatus; gynecologists who do not recognize malnutrition, digestive disturbances and consequent toxemias; nervous specialists who do not recognize organic disease in the viscera of the chest and abdomen or morbid blood states due to hetero- or auto-intoxication as explanatory of the resulting nervous symptoms; and rectum specialists who know but little of the circulatory apparatus or of diseases of the abdominal organs. I have only hinted at the relations existing between certain organs and between morbid states. The real relation is more profound and more universal.

The lack of general knowledge of the pure specialist is, I think, bad enough; but the failure to recognize the important effect of auto-intoxication and of malnutrition upon all the organs of the body, whether due to faulty habits, to environment, to poor food, bad digestion with fermentation in the alimentary tract, to malassimilation, or finally to inefficient excretion of effete material, is deplorable.

Catarrh of the throat and nose due to the above condition is treated topically for months without the least attention to the general condition of the patient. Glasses are fitted to eyes which are emmetropic and in which the temporary error of refraction is due to weakness of the whole muscular system, including the ocular muscles. Headache due to an error of refraction which is caused by malnutrition and auto-intoxication is palliated with spectacles, while the fundamental cause continues. Neuralgias of the pelvic organs and congestion of ovaries and uterus due to morbid blood states, to neurasthenia and often to a weak or diseased heart, give gynecologists full waiting-rooms and afford them abdominal sections and jars full of normal ovaries.

The above named conditions give the dermatologist an opportunity to write volumes upon skin eruptions with a nomenclature terrifying in degree. The neurologist fails to recognize many of the functional disturbances of the nervous apparatus, and even many of the organic changes of the cerebro-spinal axis as originating in the conditions named. The stomach specialist washes out an abused stomach, starves a patient suffering with malnutrition and fails to find the over-full venous portal circulation of a lung or heart disease. The kidney specialist does not recognize the full import of toxemias, hetero- or auto-intoxications upon the blood-vessels and upon the kidneys, nor does he often realize how near to the kidneys are the organs of digestion and assimilation.

I appreciate the fact that there are special causes acting upon special organs which the respective specialist recognizes. I also confess that a single organ or apparatus diseased may affect the whole body and produce symptoms remote from the offending organ, with phenomena so confusing that the general practitioner is often confounded, while the gynecologist with speculum and knife, the oculist with lens, the rhinologist with adenoid scoop, the rectum specialist with pocket snipper, triumphantly point to patients relieved of backaches, neurasthenia, headaches, dyspepsia, constipation, nausea, vomiting, irregular heart, etc.

This same effect of a diseased organ upon remote parts of the body is, however, the stumbling block of the narrow specialist. He can see no farther than the organ he has selected as his own special plum. The man or woman is only the special organ he has selected to treat: the remainder of the individual is an attachment only.

Now, not only is specialism of to-day disorganizing the medical profession, but it is spoiling the patient. It is not unusual to find an invalid whose suffering depends upon one principal thing, visiting an oculist, a stomach specialist, a dermatologist, a urinalysist and several other specialists at one and the same time, acting independently of one another, while the family physician, the general man of the constellation, stands by as umpire, occasionally throwing in an anticonstipation pill.

Now we must have specialists. They should, however, be men of general experience. They should be as thoroughly grounded in the fundamental branches of medicine and in the principles of medicine and surgery as the general medical man. They should be capable of recognizing the general causes which may affect some special organ, and they should know what measures to pursue to relieve the patient not only by local but also by general treatment.

Our medical schools should teach more of the principles of medicine and surgery. The disease, both general and special, should be presented as examples of certain principles, and all deductions and conclusions should be referred thereto. Our young men should be taught to look upon the specialties as a part only of a whole—a part which may be understood only when the whole is mastered. To educate the student in this way it will be necessary to make the specialties according to general medicine and surgery, and to show him by practice that to become a successful practitioner in a special field he must first become a general practitioner.—*Med. Standard, Feb. 1898.*

* * *

SYSTEM TO ASSIST IN THE IDENTIFICATION OF CRIMINALS AND OTHERS BY MEANS OF THE TEETH. By B. B. Marco, D.D.S., New York. Read at First District Dental Society of New York, Dec. 14, 1897. My idea is to introduce this system of identification into the Detective Bureau of New York. Once established here it will soon make its way into the army, navy and insurance companies. By the means of this system deserters of the army and navy, criminals, and, in fact, all persons can be more readily detected than by taking note of any physical peculiarity, which can be easily modified or changed.

My system is as follows: There must be a carefully prepared chart of the thirty-two teeth in the mouth, so that the examiner can have it before him and mark down each peculiarity as it presents itself.

First. Color, shape and size of the teeth. *Second.* Note any irregularity of the teeth. *Third.* If any teeth are missing, which ones. *Fourth.* Gold crowns, pivots, or bridges. *Fifth.* The filling of each tooth, and what materials used. *Sixth.* Any carious teeth. *Seventh.* Note if any plate is in the mouth, and of what material it is composed; number of teeth on same; also size, shape, and color of teeth and plate. *Eighth.* Note the four basal temperaments. *Ninth.* Shape of arch, as saddle or V. *Tenth.* Formation of the lips.

Let us take John Smith, prisoner. His picture is first taken; then the Bertillon system is next used for measurements, etc.; now let us add the identification by means of the teeth. Teeth have a yellowish cast, longer than they are broad, quite large, firm articulation; lips full; in upper jaw right cuspid far out of line; large gold filling in upper left central; upper first bicuspid, gold cap; in lower jaw, left central and lateral missing, left cuspid carious; arch, saddle-shaped; his temperament is bilious. Thus, you see, we have a description of a man's mouth as true and perfect as a photograph of his face.

The question might arise, Suppose he extracted his teeth? Well he would have to take out almost every tooth in his mouth to deceive the carefully prepared chart. A man may shave his beard and moustache, his hair and eyebrows; he may contort his face so as to change measurements; he may cross his eyes, twist his mouth, affect lameness or a stoop; but unless he extracts all of his teeth there will be some tell-tale among them that would betray him. As you know there is no certain means of identification, but, in my opinion, the teeth are the most positive. You cannot change the malformation of a jaw, nor the irregularity of teeth, after a certain age.

Now, we realize that any layman could not give a good and accurate description of the mouth; but the system can be so simplified that any ordinary country constable could both send or identify a description of the mouth; and in the cities, where the head officials are mainly men of marked intelligence and education, they could, with a little instruction, in a short time fill out a perfect description.

This system, after consideration, must appeal to you as being not only for the advancement of dentistry, but a useful addition to our already valuable Detective Bureau. What I ask in return is your cooperation in this matter.—*Dental Cosmos, Feb. 1898.*

CATAPHORESIS. By Henry W. Gillett, D.M.D., Newport, R. I. Read at New Jersey State Dental Society, July, 1897. One of the most important developments of the year in our knowledge of cataphoresis relates to the change in our views of the method by which solutions are transferred from one point to another. In considering the process to be a modified osmosis, we assumed that the current flow through the tissues resulted in a stream flowing from positive to negative, in which our drug was transported somewhat as chips float down a brook into which they have been thrown. Another view was illustrated by one writer who compared topical application of the drug to a nail held against the board, and the current to the hammer blow which drove it in.

These views have been materially changed in the past few months, and the writer's present estimate of the process would be better illustrated by the statement that, when we place a drug at one electrode, and pass the current, the opposite electrode becomes more attractive and the drug proceeds thither, just as a child will be content to be with its nurse at one end of the room till it discovers its mother at the other end. Then, if free to do so, it goes to the mother. Its sense of sight keeps it moving on step by step towards the goal, just as the current keeps the drug going on by making the area ahead of each molecule more attractive than the position which it occupies. It is a process of leading, rather than of driving, or carrying by force of current flow. This modification of our views is made necessary by the discovery that many drugs do not move in the direction of the assumed current flow, but rather in the opposite direction, from negative to positive.

The first published statement of experiments demonstrating this fact, which came to my notice, was that of Prof. W. J. Herdman. He demonstrated that potassium iodid travels from negative to positive as a compound molecule, and having reached the position it is electrolyzed or split up into its component parts.

Anaphoretic action of Iodin. Following out this line of experimentation, the writer reported at the recent meeting of the New York State Society experiments corroborating Dr. Herdman's conclusions concerning potassium iodid, and demonstrating that iodin, both in compound solution and in tincture, moves in the same direction, from negative to positive. In other words iodin (in these three forms at least) is anaphoretic (Herdman) instead of cataphoretic.

As these experiments will be published later, they will not be detailed here. They lead to the inference that the results following the cataphoretic use of iodin have followed rather because of the prolonged contact and consequent favorable conditions, than because of the deep penetration of the iodin. The direct effect of the current itself in modifying the local conditions may also have been a factor.

The rapidity with which iodin and its compounds travel through media in laboratory experiments, leads to the conclusion that its application anaphoretically should be made with extreme caution until we have more clinical evidence as to the results when it is so applied. The writer would consider it unsafe to make long application, or to use other than very dilute iodin solutions in that way. The saturation of gum tissue and alveolus, for instance, to a depth of one-quarter or one-half inch with a strong iodin solution can scarcely be other than disastrous. Iodin travels in cotton under a current of three milliamperes or less with considerable speed (one inch in ten minutes). Potassium iodid travels still more rapidly under a similar current (two and one-half inches in seven minutes being one record).

It is to be noted also that the statement that the transfer of the drugs comes to a stop midway between the two electrodes is an error. At least iodin and iodin compounds, so far as tested, go all the way to the positive electrode, when placed at the negative and exposed to the influence of a suitable current.—*Items of Interest, Feb., 1898.*

RHEUMATOID ARTHRITIS.—A skeleton was found in the course of some scientific explorations last winter in Egypt, which has shown, upon examination in London, every osteotic evidence of rheumatoid arthritis, and the case is of striking interest as showing the pathological conditions as far back as 3700 B. C., to which time there is abundant proof that this skeleton belonged.

CHEAP CROWN.—By W. C. Kerns, D.D.S., Piqua, O. Frequently we have cases where the patient is unable to pay for a gold crown. In such cases I make a silver band to fit the tooth, the same as if crowning, fit and adjust the band, and fill with amalgam, allow the patient to bite, then remove the surplus after it is hard, burnish, and you have an excellent cheap crown.—*Ohio Dental Journal.*

POOR DENTISTRY COSTS A LIFE.—H. E. Pratt died yesterday after a two days' illness. Last Tuesday he had the nerve in a tooth removed, and allowed a careless dentist to cap over the opening at once. Before many hours had elapsed the tooth began to give him great pain, and he grew rapidly worse. Physicians pronounced it a case of blood poisoning, and all efforts to save his life proved fruitless.—*Chicago Tribune.*

Letters.

CRITICISM BY DR. J. FOSTER FLAGG.

SWARTHMORE, Pa., March 23, 1898.

Dr. J. N. Crouse,

DEAR DOCTOR:—With this I request that you will refrain from sending me any more suggestions of subscribing to the DIGEST.

Although I have never joined the "Protective Association," as I have never had any occasion to use any patents except those I was entirely willing to compensate for, I have yet been directly instrumental in having *many* join it who desired mutual protection. I have always urged it upon our classes, and in social and society conversations have always advocated it.

But your other work, as it has developed, I have no sympathy with, and the culmination in the shape of that obsolete "bastard" alloy which you offered as the "Perfect" alloy, and which was simply a *spoiled* "Submarine," and *guaranteed* by the enormous experience of "several months," *you know* exactly what *my opinion* of *that* would be.

I am sorry that you, with your protective record, found it needful to resort to that which you seem to have had to, and I desire not to be further reminded of it.

Truly yours, J. FOSTER FLAGG.

REPLY TO DR. FLAGG.

Dr. J. Foster Flagg, CHICAGO, March 26, 1898.

DEAR DOCTOR:—Your letter just received. I did not know that you had been asked to subscribe for the DIGEST, as the detail part of that work is carried on by others, but I am sorry the suggestion gave you any annoyance.

I have often wondered why a man of your pretensions should urge others to join the Protective Association, and by so doing help protect you, and yet keep your own $10 in your pocket. Did it ever occur to you that you would probably have had more influence with your students and have stood in a more respectable light with your profession, off whom you have lived for many years, had you joined the Association? The effect on a man's conscience of allowing others to stand the whole expense, even though small, to which

he should contribute his share, is demoralizing, and you must have therefore belittled your character in your own estimation, as you certainly have done so in the eyes of your fellows.

Now as regards the question of alloy. I read with much amusement your bombastic communication in the American Dental Weekly for February 17. In that effusion you say: "At this late date in amalgam alloy work these two instruments (micrometer and dynamometer) are practically useless, as we have been thoroughly informed upon shrinkage and expansion for the last twenty years, and as there is no alloy sold which does not make an amalgam sufficiently hard for all services required."

In reply to the first part of this remarkable statement, if you have been thoroughly informed upon shrinkage and expansion for twenty years, it is unfortunate for those who have had confidence enough in you to use your alloys that you did not either employ some one sufficiently talented to prepare an alloy that did not shrink, or else abstain from swindling your fellow practitioners by selling them one which leaks so much that it is unfit for use as a filling material. "Darkening the tooth structure," which you claim for "Submarine," does not by any means save the tooth from destruction.

As regards the strength of various alloys, one of the greatest defects in amalgam fillings has been that they change their shape, and consequently position in the cavity, under force of mastication, and it has always been admitted that edge strength was generally lacking, yet you say there is no alloy sold that is not sufficiently hard, etc. If you had ever seen tests made with these instruments which you condemn as useless, you would be ashamed to make such statements.

The analysis of "Fellowship" alloy which you publish is about as nearly correct as you generally get things. No one of the older members of the profession will be led astray by it, and I denounce your analysis as very inaccurate simply for the benefit of the younger men who do not know you so well. The time has passed when you can fool the dentists, for they are beginning to think for themselves.

Now, Doctor, do not be at all alarmed that I, knowing you as I do, and seeing the miserable failures you have made in attempting to furnish a decent alloy to the profession, would copy anything from you. "Fellowship" alloy is not by any means a "bastard,"

nor are the metals contained in it antagonistic to each other. In offering it to the profession I have rendered them a great service, and have done what should have been done twenty years ago, viz., given them an alloy which was reliable and uniform. It was put upon the market only after I and the expert metallurgists whom I employed were thoroughly satisfied that it answered every requirement for an ideal filling material. Furthermore, this is the opinion in which it is held by all who have tried it.

Yours very truly, J. N. CROUSE.

PHILADELPHIA LETTER.

Dear Digest: PHILADELPHIA, March 19, 1898.

Your recent editorial on the patent question has stirred up the editor of the *Items of Interest* to such an extent that he devotes fourteen pages of the March number to the subject. As far back as our memory can carry us in dental journalism, this is an unprecedented editorial—in length.

Our second source of recent enlightenment upon patents is in the form of a circular letter from R. B. Donaldson, of broach fame. His communication can be termed simply a begging letter. He endeavors to play upon the sympathies of the profession to such an extent that they call him blessed—for what we fail to see, unless it is his compact with tradesmen to extort large sums of money from his fellow-practitioners for a very trifling thing. We say fellow-practitioners, as a part of his plea is the fact that he practiced dentistry for forty years. Dr. Donaldson closes his letter by saying, "Perhaps it had been better had I remained silent until the judgment of the court had been announced." What a pity he did not consider that point more seriously before he sent out that letter—if *he* sent it out. We would invite Dr. Donaldson to read, as a reply to the aforesaid letter, your contribution to the subject in the February DIGEST in reply to Dr. Howe's queries.

We are very pleased to report that our state board of dental examiners has reconsidered the order concerning the time of holding the spring examinations, of which we wrote last month. The members of the board have righted themselves in this matter, but at once make another blunder, which to our mind is more serious and will be more far-reaching than their first would have been had they carried it out. This time they are sinning against themselves, by

allying themselves, in a measure, with a dental college. Now if there is any one thing they should do, it is to keep aloof from the colleges. We believe that the examinations would be just as fair and honest held in a college lecture-room as in a public hall, but such a proceeding places both the school and the board in a position to be criticized. It is hoped the board may recognize this short-sighted step and correct it ere it is too late. We think it a poor sort of professional spirit which shuts its eyes to existing evil or coming dangers, and it seems to us that the question of examining boards, their legal status, arbitrary powers, etc., is one of the perplexing problems of the future.

Some of the most valuable articles in the *Items of Interest* have for some time been the series on the "Office and Laboratory." Many have been enlightened by the knowledge that Dr. So-and-So had three rooms, floors carpeted, and was the possessor of some antique furniture; that another supported an office assistant, and a colored boy with a white jacket. Now we are presented with the photograph of the doctor's wife, at least we take it to represent such a personage. She seems very close to him. This is quite an acquisition to our knowledge of dental matters.

The Odontological Society met by invitation this month at the residence of Dr. Bonwill, and the doctor gave them a rare treat—an essay or talk of an hour and a half in length. Many of us regret that we could not avail ourselves of his invitation and hear him tell of his wonderful experiences abroad. We learn that Dr. Bonwill gave it as his opinion that the big guns in Europe, those who make the most noise about antiseptic treatment, sterilization, etc., are in actual practice not so cleanly nor so careful as the average dentist in this country. This is a compliment to America.

Cordially yours, THE SPECTATOR.

NEW JERSEY LETTER.

To the Editor of The Digest, NEWARK, March 21, 1898.

MR. EDITOR:—New Jersey is again to the front, the new dental law having passed the legislature last week. We now have a law inferior to none, and we think superior to all. It is simple, concise and to the point, and can and will be enforced—a fact which does not obtain with many of the laws in our sister states. Its main features have been told in a former letter.

We notice in a letter from a New York correspondent to the *Dental Review* that the writer, after a brief summary of the toasts at the annual meeting of the Central Dental Association, remarks that "Newark is such a journey from the metropolis that the Jersey boys must feel themselves complimented to get such attendance at their event as they did, and more complimented by the attendance of those from afar." We certainly do appreciate this, and would not be hosts unless we did. At the same time this seems to be a nice little way our friends from Gotham have of expressing themselves about almost everything that happens outside the metropolis. Of course we cannot agree with any such sentiment as this, as this portion of the United States has passed the limits of a country town and need no longer make pretentions that cannot be justified by facts. Our impression is that our friends from across the bay know where they can get a good dinner and plenty of good cheer, and realize that they can reach and return from Jersey sooner than they can from many points in their own city. We enjoy their company and try to give them a right merry time.

On the 21st inst. Dr. M. L. Rhein gave the C. D. A. a very interesting and instructive paper on "The Rational Treatment of the Dental Pulp." It was warmly discussed and made quite an impression. We predict that it will call forth much discussion from the profession, as its lines are very radical in contrast with the practice and precept of many from whom we often hear on scientific points.

Dr. Riley, the newly elected president of the C. D. A., presided for the first time at this meeting. It was auspicious that he had such a good paper for his initial attempt. He is full of fire, snap and ideas, and we prophesy a very successful year under his ever watchful guidance.

Dr. Gregory, as the new chairman of the executive committee, also made his first bow to the dental world as one of the managers of the association. He is already in active correspondence with a number of our confreres, with the view of having them favor us with essays during the coming year. He will have to look to his laurels to equal Dr. Barlow, who has had this in charge for a number of years.

Dr. Harvey Iredell, chairman of the electrical exhibit of the state society, is alive on that line, and has the promise of many exhibits

already. This department will be a very full one, and without doubt the most extensive ever shown at any dental meeting. He has the active cooperation of the editor of the *Electrical Review* of New York city.

We have just received a list of the members of the examining boards of the United States. Notwithstanding the severely adverse criticisms upon the N. A. D. E., which have been published in several of the journals during the winter, the association is stronger than ever, and is going on with its work regardless of these external irritations. The members are confident of their position, and that it is the right one. Fraternally yours, HORNET.

NEW YORK LETTER.

To the Editor of the Digest, NEW YORK, March 17, 1898.

MR. EDITOR:—Editorials nowadays are not only numerous but spicy, and it does not follow that criticism means a personal quarrel. We have not had enough editorial discussion, but it looks now as if it would be more than plentiful. We recall one editorial which claimed that the personal pronoun "I" was the proper thing to use. We always thought that it was considered proper to give a leader to the writer of an article. We think an editor has a better place for display in the editorial columns than in the place of a leader, particularly in his own journal.

It is truly amusing to note how we are being turned about by efforts in the patent line. Money is the cry in this age, and the love of it is the root of all evil.

By some oversight we had missed reading until recently Dr. Williams' reply to the proceedings of the New York Stomatological Institute. It is a real pleasure to peruse so clear and concise a statement as this article. We mention only the first seven lines, the ending of the first paragraph commencing the reply, "It is so difficult for human nature to get away from itself." There is a big lesson in these two quotations, and if strictly followed in their teachings they would bring a harvest for good will and help on the greater advancement for knowledge. Any one who does not read Dr. Williams entire, providing he does not let prejudice dominate him, will lose much.

What a pity that there are some men who take criticism as personalities. No one is fit to edit a journal who allows such a thought to

enter his mind. We are sorry to hear such unjust judgment pronounced against those who have earned far more gratitude from their fellows. The sweetest reward, however, is one's own conscience, which keeps safely guarded the true motive of our purposes. No one can take this away. Alas, so many have given up with broken hearts, because their associates misjudged them. We must be free from all treacherous spirit; too much of it is apparent in New York.

We welcome New York correspondent No. 2, for he shows more than ordinary ability in this line.

Brooklyn seems to have a better prospect of being heard from in our journals. The profession in that city have kept too much aloof.

The new deal of the Odontological Society in the choice of an executive committee to direct the Dwinelle Clinic already shows energy and the bringing out of attractive ability—this month Professor Harlan; Delos Palmer, son of Corydon, and a four years' pupil of the late Dr. Atkinson; and Dr. St. George Elliott, who is famous for his ideas in useful devices. Dr. Elliott has covered a large area of the civilized world in his practice—the East Indies, Japan, London, and back to New York the second time, securing in all these places a large and successful clientage.

We see that Dr. Van Meter, Sr., has taken up the plugger after a period of retirement from a long and successful career in Rome, Italy. He is now at Tacoma, Wash., in the big northwest, full of energy and ozone. We learn that the tide of prosperity is coming back to the northwest, and we wish the doctor a successful career in his new venture. We knew him in the earlier days, and have lately made the acquaintance of his widely-known and accomplished daughter, Lady Bennett, of England.

The class of men we have met from this attractive northwest, so full of energy and ambition, has stirred our blood not a little, and we are almost tempted to push out. Our New Mexican trip a few years ago gave us such a feeling of exhilaration from the high altitudes that we have not yet lost the benefits gained. We were built up physically, and the harvest of fees which were freely bestowed by the guardsmen of our national frontier was not a small item; we were also treated with a princely hospitality. Our army and navy patients have been among the most appreciative, and we might in passing say that our visit to the different posts revealed a dire need of dental ability, as an auxiliary to the medical and surgical.

The following clipping from the *New York Herald* of March 16 indicates that Dr. Evans' wealth is to come to the aid of dental instruction: "DR. EVANS' WILL UPHELD. Paris, Tuesday.—The court of probate has rejected the petition of Rudolph Evans, the only surviving brother of the late Dr. Thos. W. Evans, who died here last November, for the appointment of a judicial administrator with a view of preventing the executors from taking possession of the testator's estate. The court has granted the petition of the executors to take possession."

The meeting of the First District Society this month was favored with a paper from Dr. Talbot, of Chicago, which was characteristic of his well-known ability as a writer.

The Odontological Society has awakened an unusual interest in New York by clinics, and they are of a kind that well repays the visitors. Professor Harlan was present and attracted more than ordinary attention, manifesting an intelligent and practical interest in the subject of pyorrhea alveolaris. His finely devised and skillfully made set of instruments were objects of much comment. A paper followed in the evening, which edified a large audience and drew out a good deal of quizzing. This is due to the fact that Dr. S. G. Perry has a very seductive and persuasive ability and ready wit in good training. We notice several of the former dissenters, who left this society, again in attendance. A hopeful reaction, and we predict that more will sooner or later follow.

Dr. Delos Palmer's exhibition was well given, with ingenious apparatus. Dr. St. George Elliott gave a very unique exhibit. His pneumatic mallet is a real novelty, operated both by foot and electricity. The delicacy of construction was marked.

We met Dr. Kingsley just returned from a trip to the Bermudas, and we trust that he may soon regain his much depreciated state of health. Cordially, NEW YORK.

RATE OF SOLUTION.—A. A. Noyes and W. R. Whitney claim to have experimentally established the law according to which solid substances are dissolved in their own solutions, and they express it in the following terms: "The rate at which a solid substance dissolves in its own solution is proportional to the difference between the concentration of that solution and the concentration of the saturated solution." This law has proved to be correct in the case of substances so widely differing in chemical nature and physical properties as benzoic acid and lead chlorid, and it is therefore assumed by the authors to be of general application.—*Jour. Am. Chem. So., xix., 930.*

The Dental Digest.

PUBLISHED THE

TWENTY-EIGHTH DAY OF EVERY MONTH.

Editorial.

NEW DENTAL JOURNALS.

We are pleased to welcome to the ranks of dental journalism two new monthly publications, the *Dentist*, published in London, Eng., and the *Indiana Dental Journal*, published at Indianapolis, Ind., and edited by Dr. Geo. E. Hunt. They are both neatly gotten up, and the first numbers give promise of much good.

We feel that an apology is due Editor B. H. Catching and his corps of able assistants, of the *American Dental Weekly*, for not having ere this taken notice of that paper. The omission was due to our not receiving the first few numbers, and to oversight in the rush of other matters. We enjoy its weekly visits very much, and wish it an abundance of success.

ILLINOIS STATE DENTAL SOCIETY.

The annual meeting of this organization will be held at Springfield May 10-12, 1898, and an interesting and valuable program is promised. This society is one of the largest and most enterprising of the various state dental societies, and every dentist in the state should feel it his duty to attend, not only to receive the benefits which always come from such a gathering, but also to do his share to help in the good work. On behalf of the officers we extend a cordial invitation to all dentists outside this state to be present and participate in the meeting and discussion.

A SHEEP IN WOLF'S CLOTHING.

We have read with interest the editorial in the March *Items of Interest*, entitled "The Blind Leaders of the Blind," and we are more than ever convinced that the editor of that journal deserves the title. He has attempted to push the dental profession into a presentation of "A petition to Congress for an act to restrain the granting of patents upon any method of treating human disease." We characterized this performance as a proceeding which was in

itself sheer nonsense and bade fair to make the dental profession an object of ridicule. The editorial in the last *Items* is ample confirmation of our former statement.

We repeat that there are no patents granted upon methods of treating human disease. The science of the prolongation of the vital forces is not the subject matter of patent monopoly, and no man or court has ever known of any physician or surgeon being prosecuted for infringement of a patent by reason of anything done by him in the treating of human disease.

The last editorial in the *Items* shows plainly that up to this time the editor did not know just what he meant nor really mean what he said. It now appears that he intended that dentists as a class should petition Congress to restrain the granting of any patent upon any mechanism or procedure of any description employed in the practice of their profession.

Of course such a petition as this in view of the facts that should be known to the editor of any journal, and which are certainly known to the great body of the dental profession, is simple folly. The time has not now come, nor will it ever arrive, when any particular body of men will by class legislation be exempt from the patent laws. The farmers of this country are the most harassed by patents, and as they and many other persons believe the whole patent system should be abolished, an organized attempt is made during almost every session of Congress to secure the repeal of the patent laws, or at least to materially modify their enforcement and scope, but no petitioner has ever been so foolish as to suppose that any particular class of citizens, industrial or professional, could be relieved by class legislation. There is another reason why this petition—to prevent the granting of any patents relating to mechanical appliances or procedures employed by a dentist—which the editor of *Items of Interest* desires to present to Congress, is absurd. All such modes of procedure are carried out by mechanical methods or appliances, and the desired results are assured by mechanical effects, and all such patents relating to mechanical processes have been declared invalid by the Supreme Court of the United States.

The decision to this effect is known as the case of Risdon vs. Medart, 158 U. S. 68, and of such are the long list of patents which are referred to in the aforesaid editorial. This decision was cited by Judge Wheeler in deciding the Low Bridge Patent invalid. We

called attention to this fact when discussing Dr. Ottolengui's report at the New York State Society meeting last May. Judge Wheeler's decision was published in full in the DIGEST for April, 1896, and in several other journals about the same time.

Notwithstanding all this the editor of *Items* says, "The fight has been conducted solely on one line. The patents have been fought separately and one after the other declared invalid, because priority of invention was shown. In no instance, so far as has been publicly declared, has the claim been made and sustained that the method was not a subject of patent." It would appear as if the editor had gotten himself into a hole, and recognizing that fact, was now trying to pull the hole in after him.

We have always thought it to be the duty of the Dental Protective Association to protect its members from unjust and illegal patents, but we have at no time deemed it within the province of the Association to engage in foolish and hopeless attacks upon the patent laws.

We have a grave charge to present against the editor of Items of Interest, and it is hostile and fatal to his protestations that he is laboring for the good of the profession.

The Protective Association, with its ally, the Dental Protective Supply Company, is engaged in a desperate legal fight to determine the validity and value of the Donaldson barbed broach patent. The S. S. White Dental Manufacturing Company claims to have the right to sell this broach, and the testimony already taken shows that the dental profession have thus far paid that company about $200,000 as royalty under this patent, and will have to pay about $200,000 more before the patent expires. We believe this patent to be entirely worthless and invalid, and that the money already filched from the dentists by the S. S. White Company is simply an act of spoliation without justification.

According to the editor of *Items of Interest*, this barbed broach patent is granted upon a "method of treating human disease," as the article is used in the extraction of devitalized pulp and for scraping and cleaning the decayed walls of pulp-canal. Of course such a patent, for this reason alone, irrespective of its validity, would be condemned by said editor. He says in his editorial, "Treatment of the pulp should not be patented, yet such patents exist." Consequently, we would suppose that no power on earth could get him

to testify in behalf of the validity of such a patent, and to justify the taking of $400,000 as royalty from his brother dentists in the past and future, but the following are the facts:

He deliberately and voluntarily went upon the stand as a witness, in behalf of the S. S. White Company against the Dental Protective Supply Company, to sustain this patent, and gave several pages of typewritten reasons for his action in the matter. We quote a few lines from the official record of that case, showing his voluntary act and anxiety to assist the S. S. White Company in its fight to maintain this patent and royalty against his brother dentists.

UNITED STATES CIRCUIT COURT—NORTHERN DISTRICT OF ILLINOIS.

The S. S. White Dental Mfg. Co. et al. Complainant.
vs.
The Dental Protective Supply Company. Defendant.
} Bill for infringement of patent.

Rodrigues Ottolengui, a witness on behalf of complainants, having been duly sworn, deposes and says in answer to interrogatories by complainant's counsel, as follows:

Q. 1. Please state your name, age, residence and occupation?

A. My name is Rodrigues Ottolengui, my age is 36, residence New York City, and my occupation is practicing dentist. * * * I am a member of the New York State Society, the Second District Dental Society, the National Dental Association, and the Central Dental Association of New Jersey. Editor of *Items of Interest.* * * * A monthly dental magazine.

XQ. 1. At whose instance do you give this deposition?

A. I was asked to-day, at S. S. White & Co.'s dental depot, what my opinion was of the Donaldson Cleansers, and I expressed my views on the subject. Then I was asked if I would be willing to repeat that statement to their attorneys in this suit, and I said I would. That was by Mr. Towner, the gentleman in charge of the uptown house of the S. S. White Company.

XQ. 2. That was the first time you had been spoken to about the matter?

A. The first time I had ever been spoken to about this suit, except by Dr. Crouse—Dr. J. N. Crouse—by anybody.

Verily, Consistency Thou Art a Jewel, but thy name is not Ottolengui.

By the way, this gentleman has some, to say the least, very peculiar ideas. He says: "Let us comprehend what we mean by treating disease. If a man have his arm cut off by a circular saw that is an accident, but if he have it amputated because of tuberculosis that is an example of disease. If a man have a tooth knocked out in a fistic controversy that also is an accident, but if it be slowly destroyed by caries that is disease. The recognized treatment of this tooth disease is by filling. *Any method of filling teeth, there-*

fore, is a method of treating disease." * * * "To insert a set of artificial teeth is to treat human disease." To follow out his arguments—we cannot dignify them with the name of reasoning—he would allow patents upon instruments which were to be used in cases where the tooth had been lost by accident, but not where it had been destroyed by caries. The supplying of a wooden arm or leg to the remaining stump, insertion of a glass eye, making a shoe to fit a tender corn, etc., would also be methods of treating human disease.

We must vehemently protest against the illogical, unfair and flippant manner in which the editor of *Items* discusses the fifteen years' battle of our profession with the old Rubber Company. The older members well recollect the insults, outrages and ignominy which were heaped upon the individuals in our profession by this company. Thousands of dentists were sued throughout a long series of years in every state in the union, and great burdens of judgments and costs in the federal court were piled up against them simply for using a vulcanized base for artificial teeth. The early practice of hundreds of the younger members was ruined by injunctions and suits, and dentists were sent to jail by the score throughout the country for attempting to escape the effect of this patent. More than $2,000,000 were taken from dentists, not to mention everything else, and the managing officer of the Rubber Company was murdered by a harassed and goaded dentist in 1879 at San Francisco during the prosecution of a suit against him.

During all those years nothing was heard but the anguished cry of the dentists under their burdens and bondage, and yet the editor, in reference to the matter, says, "It was not the payment of the paltry fee which they (the dentists) resented." It may be that $2,000,000 is a paltry fee in his opinion, but the payment of this sum was a serious and sore matter to our profession during those dark days and it has not been forgotten.

Had the Dental Protective Association been in existence at the time of the Rubber Company's litigation, all this harassment and piratical plunder would have been averted and the $2,000,000, less the outlay of $10 each for membership fees, saved; as there is not a particle of doubt but that if an honest and earnest defense had been made the patent would have been defeated. The same results could have been attained as in the case of the Crown Company,

whereby a saving to our profession has been effected of probably five times $2,000,000.

Before closing we wish to discuss the last two lines in the editor's lengthy effusion, which are, "The deepest ditch in the pathway of dentistry is the process patent, with its quagmire of license fees and royalties at the bottom." We are well aware that royalty patents are very objectionable, because of the obnoxious licenses the dentist is compelled to sign, but the robbery is much greater on worthless patents on various devices. New patents are constantly being taken out on articles which are void of novelty; simple changes are made in patented appliances on which we have been paying royalty for the full time of one patent and new patents granted on these changes; mechanisms which have been long in use are "discovered" for the first time by some individual and a patent obtained thereon; in other cases patents are obtained by fraudulent methods, etc., etc. It is not legitimate patents which inflict hardship upon us, but the illegitimate patent abuse which requires our attention. No legislation short of entirely wiping out the patent laws can prevent the continuance of this wrong, and this will never be done.

Organized effort by the dental profession is therefore absolutely necessary to protect its members. There may be a better plan of correcting these patent abuses than that presented by the Dental Protective Association, but if so it has never been presented in tangible form. We have not "grown so fond of protecting dentists from unjust patents that we cannot bear to see the dentists make a movement to protect themselves," but we do protest against abandoning the Protective Association and adopting in its place such a silly and worthless plan as the one proposed by the editor of *Items*.

Whenever we write an editorial upon the question of patents we wisely submit it to our patent attorneys—and there are no better in this country—to make sure that our position would stand a legal test. We think it would have been wise had the editor of *Items* taken the same precaution before he got himself into the awful tangle on the question of patent law in which he now is. Surely the able attorneys of the S. S. White Company, with whom he has of late been so closely associated, and whom he has assisted in the fight against our profession on the Donaldson patent, would have been only too glad to have kept him from making these ridiculous blunders, had they only known that his ideas on the question of patents were sadly muddled.

Book Reviews.

TIN FOIL AND ITS COMBINATIONS FOR FILLING TEETH.—By H. L. Ambler, M.D., D.D.S. Published by the S. S. White Company, Philadelphia, Pa., 1897.

Dr. Ambler is an enthusiast as to the use of tin, and he has been to great pains to collate from dental literature the available information upon this subject, which is here gathered for the benefit of his fellow practitioners.

CATAPHORESIS OR ELECTRIC MEDICAMENTAL DIFFUSION AS APPLIED IN MEDICINE, SURGERY AND DENTISTRY.—By W. J. Morton, M.D. One volume, large 8vo, illustrated, half morocco leather, gilt top, $5. Published by the American Technical Book Company, New York, 1898.

Dr. Morton is the recognized authority on this subject. Prior to the publication of this valuable volume, the profession have had only the occasional papers appearing in the scientific press for reference. This book covers the whole subject, and can be taken as a reliable guide-book by the dentist and surgeon. The work is profusely illustrated with fine engravings and diagrams, showing the application of cataphoretic instruments.

Notices.

KANSAS STATE DENTAL ASSOCIATION.

The twenty-seventh annual meeting of the Kansas State Dental Association will be held at Topeka, May 10-12, 1898. ED. BUMGARDNER, Sec'y.

IOWA STATE DENTAL SOCIETY.

The annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3-6, 1898. W. G. CLARK, Sec'y.

ALABAMA DENTAL ASSOCIATION.

The twenty-ninth annual meeting of this society will be held at Montgomery, Ala., April 12-16, 1898. All members of the dental profession in good standing are most cordially invited to attend. Reduced rates on the certificate plan.

W. J. REYNOLDS, Sec'y, Selma.

SOUTHERN MINNESOTA DENTAL SOCIETY.

The thirteenth annual meeting of this society will be held at Mankato, April 12-14, 1898. The meeting will be conducted by Dr. F. B. Kremer, assisted

by Drs. C. M. Bailey, I. C. St. John, M. O. Nelson and W. A. Moore, as instructors and clinicians, and will be a three days school of crown and bridge work.

TEXAS DENTAL ASSOCIATION.

The regular annual meeting of the Texas Dental Association will be held at Waco, Tuesday, May 17, 1898. The Texas State Board of Dental Examiners will convene at the same time. A cordial invitation is extended to all dentists in this and other states to be present.

J. G. FIFE, Sec'y, Dallas, Tex.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of this society the following officers were elected for the ensuing year: President, F. Edsall Riley; Vice-President, C. S. Hardy; Secretary, H. S. Sutphen; Treasurer, Charles A. Meeker; Executive Committee, F. G. Gregory, F. C. Barlow, C. W. Hoblitzell, W. H. Pruden, W. E. Truex.

H. S. SUTPHEN, Sec'y, Newark.

ILLINOIS STATE DENTAL SOCIETY.

The thirty-fourth annual meeting of the Illinois State Dental Society will be held at Springfield, May 10-13, 1898. Dentists practicing in the state who are not members of the society and dentists of other states are cordially invited to attend. The hotels and railroads will make the usual reduction. A large attendance is desired and a profitable meeting is anticipated.

Dr. E. K. Blair, supervisor of clinics, states that a very interesting program is being prepared in his department, and a list of the same will be given in the April issue of this journal.

A. H. PECK, Sec'y,
92 State st., Chicago.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

The thirtieth annual meeting of this organization will be held at Albany, May 11 and 12, 1898. Papers will be presented by the following members of the profession: M. D. Foster, Baltimore; M. H. Cryer, Philadelphia; J. S. Marshall, Chicago; I. N. Broomell, Philadelphia; S. S. Stowell, Pittsfield, Mass.; E. A. Schillinger, Dalton, Mass.; R. Ottolengui, correspondent; L. C. Le Roy, Committee on Practice.

All members of the profession are cordially invited to attend and participate in the exercises commemorative of the occasion.

H. J. BURKHART, Pres. C. S. BUTLER, Sec'y, Buffalo, N. Y.

VERMONT STATE DENTAL SOCIETY.

At the twenty-second annual meeting of this society held at Rutland March 16-18, 1898, the following officers were elected for the ensuing year: President, J. A. Robinson; First Vice-President, K. L. Cleaves; Second Vice-President, Henry Turrill; Recording Secretary, Thomas Mound; Corresponding Secretary, Grace L. Bosworth; Treasurer, W. H. Munsell; State

Prosecutor, G. W. Hoffman; Executive Committee, C. W. Steele, J. E. Taggert, J. A. Pearsons.

Next meeting to be held at Burlington the third Wednesday in March, 1899. THOMAS MOUND, Sec'y.

SEVENTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE.

The thirteenth annual meeting of this society will be held April 26 and 27, in the rooms of the Chamber of Commerce Rochester. This meeting promises to be of great interest. It is expected that the program will consist of about ten papers, and each will be thoroughly discussed. A lantern exhibit and paper are scheduled for the evening of the first day. Essayists are as follows: Drs. J. Foster Flagg, Chas. Howell, A. Osgood, F. Messerschmit, W. W. Smith, I. C. Edington, F. M. Rood, F. W. Proseus, Mr. Chas. Ward.

W. W. BELCHER, Chairman, Rochester, N. Y.

RECENT DENTAL PATENTS.

599,850. Head rest, Albert E. Larrabee and J. I. Banks, Bristol, Pa.

600,213 Fumigator, Otto Andreae, Central Valley, New York.

600,135. Electrical surgical engine, Arthur W. Browne, Prince's Bay, N. Y., assignor to S. S. White Dental Manufacturing Company, Philadelphia, Pa.

600,257. Dental separator, Courtland G. Capwell, Boston, Mass.

600,243. Angle attachment for dental hand-pieces, Henry Case and E. D. Shaw, Gloversville, N. Y.

600,211. Apparatus for washing amalgam, Henrik C. F. Stormer, Christiana, Norway.

28,345. Design, tooth support, Norman Stafford, Canistota, N. Y.

TRADE-MARKS.

31,299. Dental cement, Adolf Abraham, Berlin, Germany.

31,300. Disinfectants, Samuel B. Allison, New Orleans, La.

31,341. Magazine devoted to the interest of the dental profession, Consolidated Dental Manufacturing Company, New York, N. Y.

News Summary.

THE DENTAL AND MEDICAL DEPARTMENTS of the University of Tennessee held their annual commencement Tuesday evening, March 29, at Nashville, Tenn.

WEBSTER MFG. CO —By some accident in printing the type was broken last month in the advertisement of this firm, who handle "Sams' Combination Blow-Pipe Outfit" The prices should read $14.50 and $10.50.

PATENT BILL INTRODUCED —As we go to press we learn that the bill "Amending the Statutes Relating to Patents. Relieving Medical and Dental Practitioners from Unjust Burdens Imposed by Patentees Holding Patents Covering Methods and Devices for Treating Human Ailments, Diseases and

material, useless padding, attempts at self-advertising, or proprietary medicine puffing.—*Medical Age.*

To Prevent Disagreeable After-Effects of Chloroform and Ether Narcosis.—

℞	Morphin, hydrochlor	gr. ii¼.
	Atropin, sulph	gr. ¼.
	Chloral. hydrat	gr. iii¼.
	Aq. dest	℥ iij.

M. S.—Give ♏ xxiv. hypodermatically a few minutes preceding the administration of the anesthetic. Do not use this mixture in cases of heart lesion.—*Fraenkel.*

To Obtain a Mandrel of a Root.—By J. D. Whiteman, D.D.S., Mercer, Pa. Take a thin copper strip and with pliers secure the circumference of root in the usual way. Remove the band thus obtained, being careful not to change its shape. Press it into cuttlefish bone to the depth of its width; remove the bone that is inside the band, place around it a ferrule and pour into it fusible metal or soft solder. When cool remove ferrule and strip and you have an accurate mandrel that will be found a great aid in fitting a band to some roots that are extremely difficult as well as painful to fit directly to root in the mouth. Cuttlefish bone may be obtained at the drug stores.—*Ohio Dental Journal.*

Obituary.

HENRY E. KNOX.

Henry E. Knox, D.D.S., died in Oakland, Cal., Dec. 12, 1897, aged 66 years.

He was born in Blandford, Mass., Nov. 15, 1831, and attended the schools as were usual to New England during his boyhood. Coming to California in 1852 he found employment, but illness caused him to return to New York City in 1854. While employed in a counting-house in that city in 1856, he married Colima Lightbody.

Four years after his marriage, with a wife and two children dependent upon him, he began the study of dentistry with an old schoolmate, Dr. H. B. Noble, in Washington, D. C., and with the aid of government employment during extra hours was enabled to pursue his studies. He attended the first session of the Philadelphia Dental College, of which Dr. J. H. McQuillen was dean, and graduated Feb 29, 1864.

He was present at the dental meeting in New York City when rubber-dam was first exhibited and demonstrated to the profession by Dr. Barnum, the inventor, and returning to California Nov. 17, 1864, Dr. Knox was the first to demonstrate its use in San Francisco.

He was a charter member of both the San Francisco Dental Association, organized in 1869, and the California State Dental Association, organized in 1870. He was president of the former in 1874, and corresponding secretary of the latter for many years. He was present at every meeting of the state association, except the one held in Santa Cruz in 1896, and a very regular attendant of the San Francisco association until deafness rendered it impossible

Disabilities," was introduced in the Senate of the United States, March 10, 1898, by Mr. Platt, of New York, (by request). It was read twice and referred to the Committee on Patents.

THE *Pacific Stomatological Gazette* has been rechristened the *Pacific Medico-Dental Gazette.* The editor and management remain the same.

LOFOTEN ISLANDS AND THEIR PRINCIPAL PRODUCT, a very interesting and instructive treatise on cod-liver oil and how it is obtained, can be secured free of charge by application to Parke, Davis & Co., Detroit, Mich.

TO DIFFERENTIATE LA GRIPPE IN DECEPTIVE CASES.—A drop of blood is drawn from the finger into a tube, which is closed with a little cotton and laid away for twenty-four hours. At the end of this time the blood has become converted into a culture of the diplo and strepto-bacilli characteristic of la grippe, extremely motile and easily visible with an ordinary microscope 600 to 700 diameters. If negative results are obtained in twenty-four hours, repeat in forty-eight hours.—T. V. Coronado in *Revista de Med. y Cir. de la Habana, Dec. 25.*

AMERICAN LIQUID MALT PREPARATIONS.—Harrington has examined no less than twenty-one different brands and has found all to be very deficient in diastasic power and most of them markedly alcoholic, containing from under 3 to over 7 per cent of alcohol. In food value they approached to heavy beers, which, in fact, they resembled in most other respects.—*Bost. Jour. Med. Sc.*, through *Therap. Gaz.*

DENTIFRICE FOR DARK ENAMEL.—The following is a dentrifrice recommended in *L'Odontologie* for the use of persons the enamel of whose teeth has become discolored:

℞	Chlorate of potash	℥iss
	Powdered boracic acid	℥iii
	Carbonate of magnesia (heavy)	do
	Precipitated chalk	do
	Ess. of peppermint	5 drops.

LIEBMANN'S METHOD OF TREATING STUTTERING.—A hundred severe cases cured in the brief space of four weeks are reported by A. Liebmann, of Berlin (*Memorabilien, Nov. 13*). He has the patient repeat sentences after him, drawing the vowels and pronouncing the consonants sharp but distinctly, maintaining the conversational tone throughout without any rhythm, and avoiding the singing tone altogether. When the patient finds himself thus speaking several sentences fluently at the first sitting the psychic stimulus is immense. The method can be applied to quite small children.

GOOD SENSE.—The *Medical and Surgical Reporter* recommends that every society, and especially the American Medical Association, appoint an editorial committee which should reject, curtail, or abstract every paper not of suitable length and interest, with the same impartiality as if it were presented for publication.

Better yet, the editors of association journals should be delegated the power and privilege (and exercise it) of cutting from articles all repetitious

PRESCRIBE LISTERINE

FOR PATIENTS WEARING
BRIDGE WORK OR DENTURES

AND AS A GENERAL

Antiseptic and Prophylactic Wash
For the Mouth and Teeth . . .

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LISTERINE

Is kept in stock by leading dealers in drugs everywhere, but in consequence of the prevalence of the SUBSTITUTION EVIL we earnestly request DENTAL PRACTITIONERS to PRESCRIBE LISTERINE IN THE ORIGINAL PACKAGE.

✦ ✦ ✦

LISTERINE is invaluable for the care and preservation of the teeth. It promptly destroys all odors emanating from diseased gums and teeth, and imparts to the mucous surfaces a sense of cleanliness and purification; used after eating acid fruit, etc , it restores the alkaline condition of the mouth necessary for the welfare of the teeth, and employed systematically it will retard decay and tend to keep the teeth and gums in a healthy state. LISTERINE is valuable for the purification of artificial dentures and for the treatment of all soreness of the oral cavity resulting from their use. Patients wearing bridge work should constantly employ a LISTERINE wash of agreeable strength.

LISTERINE is used in various degrees of dilution. One to two ounces of LISTERINE to a pint of water will be found sufficiently powerful for the general care of the deciduous teeth of children, whilst a solution composed of one part LISTERINE and three parts water will be found of agreeable and thoroughly efficient strength for employment upon the brush and as a daily wash for free use in the oral cavity, in the care and preservation of the permanent teeth.

✦ ✦ ✦

LITERATURE DESCRIPTIVE OF LISTERINE MAY BE
HAD UPON APPLICATION TO THE MANUFACTURERS

LAMBERT PHARMACAL COMPANY,
ST. LOUIS.

for him to hear either papers or discussion. He was a clinical instructor in the University of California College of Dentistry from its beginning, and seldom failed his turn to clinic.

About 1868 his hearing began to be impaired, the cause being inflammation of the middle ear communicated from the throat to the eustachian tube. In 1888 he had a stroke of paralysis which affected his right side, from which he recovered in a few weeks so as to be able to resume practice. In 1895 he had a second stroke, more severe than the first, but within three months he again resumed practice, and continued until Dec. 10, 1897.

We are disposed to give more than ordinary notice to the memory of Dr. Knox, for he made more than an ordinary reputation in his profession. He has been spoken of as a pioneer dentist, and as an active agent in the formation of dental societies he was a pioneer. We feel that we are not misstating matters when we say that Dr. Knox was the prime mover in the formation of both these bodies on the Pacific Coast. This was due not so much to his executive ability, as from his earnest desire to have an association of dentists, and we will show why he wished this.

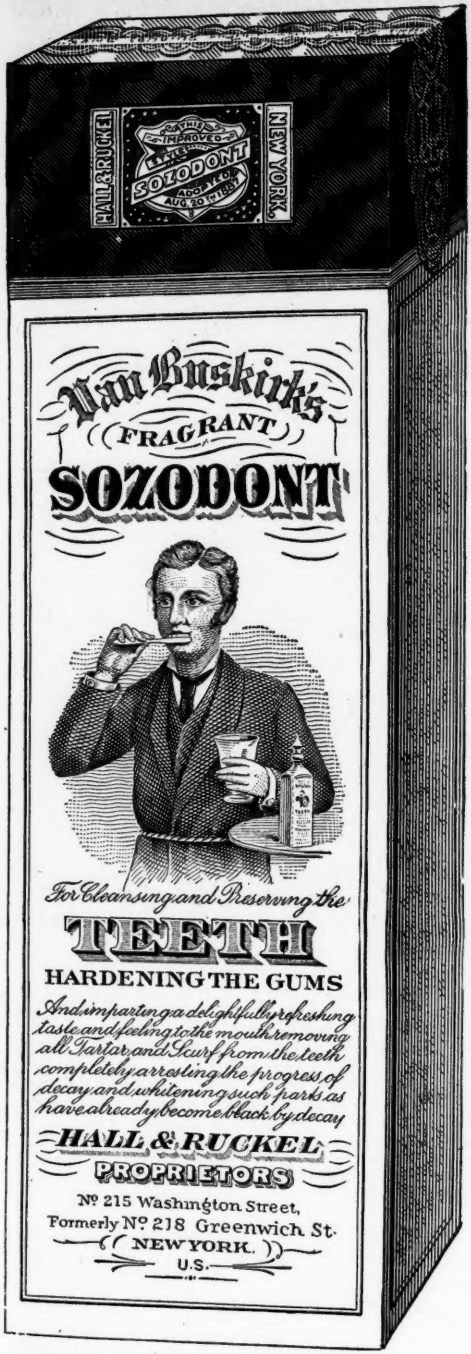
Our first acquaintance with Dr. Knox was in 1850, and it ripened into a warm friendship, and our discussing the matter with Dr. Knox led him eventually to take the study of dentistry. When he graduated we offered him an office with us in Brooklyn free of charge for a year until he got a start, and after spending three more months in Washington he entered our office.

At that time Dr. Atkinson, with his energy and fraternal purpose, had gotten several men together and formed the Brooklyn Dental Association. It was Dr. Knox's good fortune to be brought in contact with the leading lights of the day, and he was impressed by their enthusiasm and good fellowship. This opportunity, allied with clinics—the new feature of the day—gave Dr. Knox a valuable experience. It was, therefore, not strange that when a year later he went to San Francisco he was enthused with the ambitious spirit then prevailing in the east, and he was fortunate in securing his office in association with Dr. Cole, a practitioner of high standing. He soon communicated his broader views to those around him, which resulted in the formation of the two societies before mentioned.

Dr. Knox did not contribute to our literature, although we think he might have done so with credit. Neither did he aspire to office, and when his friends had forced him into the presidency of his city society, and he was loudly called upon for a speech, he arose and said, "I have been an (Kn)ox for forty years, and I do not intend to make an ass of myself now," sitting down amid a roar of laughter.

As a dentist he was among the earliest of good operators, making almost a specialty of cohesive gold fillings, numberless specimens of which will stand yet many years to attest his faithfulness. His rapidity in excavating and in packing gold was wonderful, and he enjoyed a large and lucrative practice.

His genial countenance and open heart and hand won him countless friends who will long mourn his loss. G. ALDEN MILLS.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1898

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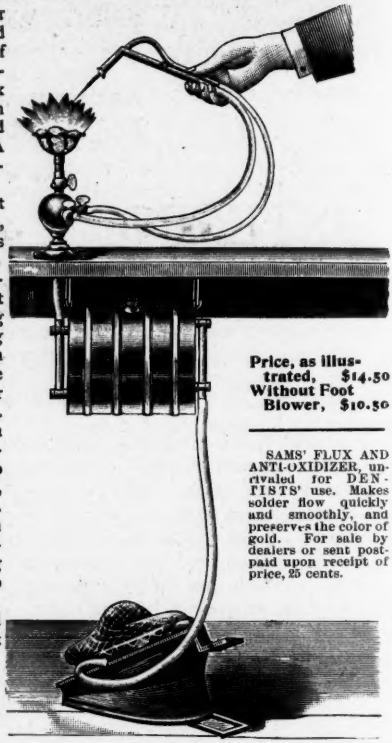
If you are practicing dentistry for your health solely, you do not need an up-to-date Blow-Pipe Outfit. If YOU are in the business for REVENUE, want to make your work easier, and expect to keep up with your competitors in the quality and finish of your work, YOU NEED A SAMS COMBINATION BLOW-PIPE OUTFIT.

It is the ONLY Blow-Pipe Outfit that gives PERFECT RESULTS, and can be relied upon to do its WORK AT ALL TIMES.

ABSOLUTELY NON-BLOW-OUT. Constructed on novel but well-tested principles, securing DOUBLE COMBUSTION, giving an INTENSELY HOT, clean, brush or needle-point flame at will of the operator. ALWAYS READY for use. Nothing to get out of order. Generator does not deteriorate with age, and the Outfit will last a lifetime. VERY INEXPENSIVE to operate. Much cheaper than gas, and much better in many respects. Blow Pipe and Mixer made of spun and drawn brass, NICKLE-PLATED, attractive in appearance, making the Outfit a useful ornament, fit to grace the laboratory of any dentist. **Satisfaction Guaranteed.** Send us your order if your dealer will not furnish. Made by



Price, as illustrated, $14.50
Without Foot Blower, $10.50

SAMS' FLUX AND ANTI-OXIDIZER, unrivaled for DENTISTS' use. Makes solder flow quickly and smoothly, and preserves the color of gold. For sale by dealers or sent postpaid upon receipt of price, 25 cents.

The Webster Mfg. Co.

WYMORE, NEBRASKA.

Wamego, Kan., Sept. 1, 1897.
After testing your Outfit, we find that it is all you claim for it. It is, without a doubt, the handiest thing of the kind ever invented, and when we consider the cost of running, it is so cheap that any dentist could well afford to invest in one.
DR. H. W. PARSONS.

Blue Rapids, Kan., July 15, 1897.
Your Blow Pipe arrived O. K., and after a thorough test I can say that I never saw one to compare with it. I have used nearly all kinds and would not exchange mine for any Blow Pipe on the market.
W. R SMITH, D.D.S.

LeRoy, Ill., Jan. 1, 1898.
Blow Pipe is just the thing I have wanted. Use it every day for something. DR. A. M. WILKES.

Humboldt, Neb., Aug. 15, 1897.
After giving your gasoline Outfit a thorough test, I find it a perfect success, having all the advantages of coal gas. DR. H. A. ALSPACH.

Manhattan, Kan., Dec. 1, 1897.
Your Outfit is the finest thing of its kind I ever saw or heard of. That needle-point flame beats the world, and it don't blow out. Had an outfit when I bought yours, but have laid the old one by. I take pleasure in recommending your Outfit to all dentists. DR. G. A. CRISE.

Great Falls, Mont., Oct. 18, 1897.
The Blow Pipe received. It works like a charm.
C. J. B. STEPHENS, D.D.S.

Clay Center, Neb., Oct. 14, 1897.
Have tried your Blow Pipe Outfit several times and consider it the most perfect one I ever saw. Had no trouble with it whatever, and would not think of being without it. DR. E. E. WILBER.

Hastings, Neb., Dec. 14, 1897.
I am using Sams' Flux and Anti-Oxidizer, and cannot say too much in its favor. I would not think of trying to do bridge-work without it.
G. E. DOUGLAS, D.D.S.

PYROZONE SOLUTIONS

FOR DENTAL USE

Pyrozone 3 per cent Solution.

A stable aqueous solution of H_2O_2 conforming to the standard of the United States Pharmacopeia. Supplied only in 4 oz., chemically clean, glass-stoppered bottles.

INVALUABLE as a mouth-wash and as a cleansing agent for the teeth. Destroys pus, blood-stains, and green-stains on the teeth. We would call special attention to the fact that **Pyrozone 3 per cent Solution** is of the strength ordered by the United States Pharmacopeia. Aqueous solutions of a higher strength are placed on the market by various makers, but these contain, of necessity, excessive amounts of acids and other preservatives, and are extremely liable to violent decomposition. Where a stronger preparation is required, it should be extemporaneously prepared by shaking the strong ethereal solutions of Pyrozone with water.

Pyrozone 25 per cent Solution.

(Ethereal.) Supplied only in small glass tubes.

INVALUABLE for bleaching teeth and for topical applications in Pyorrhea Alveolaris. Pyrozone 25 per cent is also an excellent hemostatic. By shaking two parts of Pyrozone 25 per cent Solution with one part of water and separating the mixture through a funnel, an aqueous 25 per cent Solution can be prepared in a few minutes. This can be diluted to any strength required. Weaker Ethereal Solutions can be prepared by simply diluting the 25 per cent Solution with the requisite amount of pure sulphuric ether.

NOTE—To open tubes of Pyrozone 25 per cent Solution, wrap the tube in a cloth and nip off the top with a pair of forceps having concave beaks. Do not hold the tube in the open hand, as the warmth of the latter is sufficient to boil the ether and so cause pressure to develop.

PYROZONE SOLUTIONS ARE FREE FROM BARIUM SALTS, EXCESS OF ACID, GLYCERIN, SALICYLIC ACID OR OTHER INJURIOUS PRESERVATIVE.

Illustrated Pamphlet Sent Free on Application.

McKESSON & ROBBINS, - NEW YORK

Dr. Creager's Anesthetic Pencil.

For the Painless Extraction of Teeth and Minor Surgical Operations.

Does away with the pain incident to the tying of ligatures around the necks of teeth, the forcing of crowns under the gums, the excavating of buccal and labial cavities and in the treatment of Pyorrhea Alveolaris.

Its simplicity and manner of application commend particular attention. Nothing to frighten the child or add to the fears of the parent. No sloughing of the gums, or shocking of the whole nervous system. No barbarous needle or hypodermic syringe, the most baneful implements known to the profession. It is simply a pencil applied directly to the SPOT, without fear or apprehension.

Outfit is securely packed in a wooden container.

PRICE: { Creager's Anesthetic Outfit, - - $1.00
{ Points, each, - - - - - - .50

MANUFACTURED BY

Dr. FRANK CREAGER, Fremont, Ohio, U. S. A.

SANITOL

The Ideal Liquid Antiseptic for the Teeth and Mouth.

No Acid. No Soap. No Grit. Absolutely Harmless.

Retards decay, removes stains, hardens the gums, purifies the mouth, sweetens the breath, cleanses and whitens the teeth.

With formula published, and embodying Formol and Salitrol, it has received the endorsement of the profession as possessing the highest antiseptic properties known. Advertised exclusively to the dental profession. For literature, address

THE FAIRCHILD CHEMICAL LABORATORY CO.

ST. LOUIS, MO.

A worm will turn when trod upon,
So will an unexposed pulp.
Then take the lesson while you may,
And cast your cataphoric plant away
Thumpy-te-thump!

"Thump"! That's it exactly. That's why healthy pulps are **pounded, thumped** to their death **by Cataphoresis!** How long is it going to be before the layman finds this thing out? Then, who'll get the **"Thumps"**?

If one is going to make and retain patients that are at all desirable, he must be equal to the best, and not stoically imagine a good sharp burr is all that's necessary. Nor is "stuffing of holes" in teeth all that there is in the

HIGH ART OF DENTISTRY.

There are the different forms of **Peridental Inflammation, Abscesses, Pyogenic,** tissues, **Pyorrhœa, Pulpitis, Hypersensitive Dentine,** and some ten other **"Swamp Angels"** that are not always successfully handled.

They Can Be! And That Easily!

by employing Dr. Thayer's A=Os. Note please, that the A=Os will **not kill pulps** or injure tooth structure. **Their cost is small! Their usefulness immense!** Further information will be given. **Please write name** and **address plainly!** Mentioning DIGEST. Address Dr. Thayer, Laboratory, Williamsburgh, Massachusetts, formerly Brooklyn, N. Y.

In January we found one expert (?) who had killed a healthy pulp by using cataphoresis. In February another brother who was moaning in that he had killed five pulps for his patients and still another dentist who had had **two healthy pulps** destroyed in his own mouth.

Let your patients see that the water you hand them has been freshly drawn, or allow them to draw the hot water for themselves from the only

HOT AND COLD WATER

Fountain Spittoon

(Patented May 5th, 1896. Other Patents Allowed.)

Boiler provided with Aluminum Shield, Bunsen Burner and Gas Supply Cock.

Price, complete with Saliva Ejector, silk covered Tubing, Chair Bracket, telescoping Drain Pipe, Gold and Steel Trap, etc.,

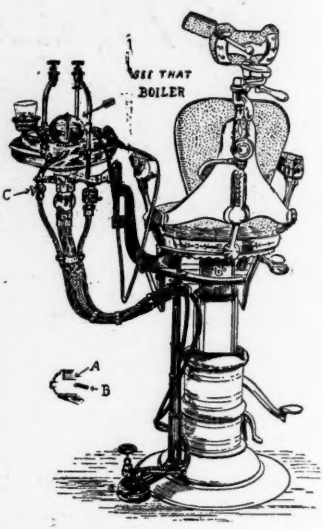
$63.50 NET CASH.

Either style, to attach to chair or with adjustable Ball and Socket Stand (even ball and sockets highly nickeled.) Our bowls have been increased from 9 to 12 inches.

Note the construction of our bowls in the little sectional sketch "A" is a downward projecting flange, "B" part of the revolving jets in center of bowl. Note, also, our patent-allowed method of attaching to chair. See the metal telescoping drain pipe.

Our list price is $100, but at present we are giving a discount of 40% for spot cash, saliva ejector $3.50 extra, making $63 50 net.

All infringers of our patents will be prosecuted.



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629 N. Carey St, Baltimore, Md., U. S. A.

ODONTUNDER

OVER EIGHT YEARS' STANDING WITHOUT A SINGLE FATALITY.

Write for our Special Terms.

Odontunder is Guaranteed to Give Perfect Satisfaction.

Odontunder will not deteriorate Every bottle guaranteed. Cash to accompany order or goods sent C. O. D.

References: Commercial Reports, Fredonia National Bank,

RECENT TESTIMONIALS.

DALLAS, TEX., NOV. 25, 1897.

ODONTUNDER MFG. CO, Fredonia, N. Y.

Gentlemen—Please send $10 worth of Odontunder as early as possible, as I have but a small amount on hand. I would not use any other anesthetic. Have been in the regular practice for fifteen years, and I must say Odontunder takes the cake. It has built up my practice to a great extent. Have used Odontunder for five years and have never had the slightest trouble. Ship at once by express, C. O. D., and greatly oblige,

Yours respectfully, O. B. NICHOLSON.

CLAYSVILLE, PA., Feb. 8, 1898.

ODONTUNDER MFG. CO.

Gentlemen—Please send me twelve ounces of Odontunder by first express. I have used Odontunder for seven years, and like it better every day. I have patients who come for miles right past other operators, and good ones, too, in order to have Odontunder used. Send at once.

Yours very respectfully, E. R. DENORMANDIE.

So generally is Odontunder used that we guarantee to send you the name of some friend or classmate who is using it with whom you can correspond.

Single Bottles, 2 ozs., $2, by Express. **Three Bottles, 6 ozs, $5, by Express.**

Beware of any one else offering Odontunder for sale or claiming to have bought the formula. Odontunder is sold only from the house direct.

Six Bottles, 12 ozs., $10, Express Prepaid.

ODONTUNDER MANUFACTURING CO., Fredonia, N. Y.